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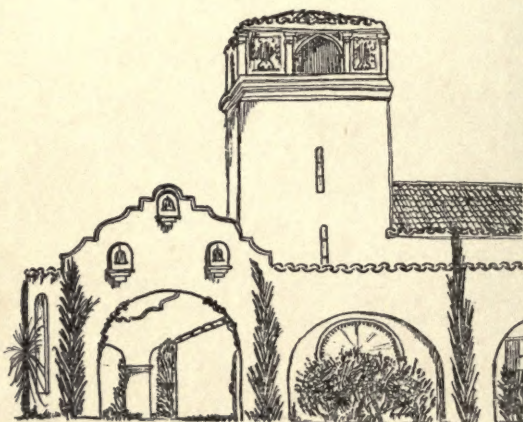
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COLLEGE OF OSTEOPATHIC PHYSICIANS
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CONSUMPTION

ITS RELATION TO MAN
AND HIS CIVILIZATION

ITS PREVENTION AND CURE

BY

JOHN BESSNER HUBER, A.M., M.D.

FELLOW OF THE NEW YORK ACADEMY OF MEDICINE; MEMBER OF THE NATIONAL ASSOCIATION FOR THE STUDY AND PREVENTION OF TUBERCULOSIS; VISITING PHYSICIAN TO ST. JOSEPH'S HOSPITAL FOR CONSUMPTIVES; MEMBER OF THE ADVISORY BOARD, THE NEW MEXICO COTTAGE SANATORIUM, ETC.



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TO
MY ELDER BROTHER
BOTH IN YEARS
AND IN LITERARY COUNSEL

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1912

PREFATORY NOTE



THIS book has from its inception to its end been intended to be exactly what its title denotes,—a comprehensive exposition of the effect which consumption has had upon civilization, and a consideration of its relation to human affairs. Its scope is wider than that of a medical treatise, although I believe it will be found an adequate, if not an exhaustive, text-book upon this disease, which is so destructive to the human race. Indeed, it is quite essential to view the subject very broadly. Manifestly, medical science cannot cope alone and unaided with this difficult and prodigious world-problem: many forces — economic, legislative, sociological, humanitarian — must be enlisted. This essay, then, is addressed both to the physician and to the layman. I should not wish the latter, while reading it, to be imagining vain things concerning himself; and so I have put matters of a purely technical nature, except where otherwise indicated, in appendices.

I thank the publishers and their efficient and exceedingly helpful staff for the manner in which they have put my work into the form and substance of a book.

The gist, at least, of some of these chapters has appeared in various journals; and I beg to express my sense of obligation to the editors of *The New York Medical Journal*, *The New York Medical News*, *The New York Medical Record*, *The Medical Times*, *The Boston Medical and Surgical Journal*, *American Medicine*, and *The Popular Science Monthly*.

J. B. H.

Contents

PART I.

GENERAL CONSIDERATIONS.

CHAPTER	PAGE
I. Introductory	17
II. Evolution and Consumption.....	21
III. Ancestry—The Present Life—Posterity	23
IV. The Psychic Element	29
V. Literature and the Arts.....	32
VI. Historical	40

PART II.

THE SPECIFIC CAUSE OF TUBERCULOSIS.

I. Germs.....	51
II. The Germ of Tuberculosis.....	54
III. The Koch Bacillus and the Tubercle.....	56
IV. Avenues of Infection.....	61
V. Human and Bovine Tuberculosis.....	63
VI. Latency.....	66
VII. Immunity.....	68

PART III.

PREDISPOSITIONS TO TUBERCULOSIS.

I. Preliminary	73
II. Hereditary Influences.....	74
III. Prenatal Influences	76
IV. Intrinsic Postnatal Factors	78
V. Environment.....	82
VI. Rural Districts	85

PART IV.

SOCIOLOGICAL.

I. Economics.....	89
II. Races and Peoples	100
III. Overcrowding.....	108
IV. Occupations.....	112
V. Habits and Social Customs.....	120
VI. The "Lunger" in the West.....	124

PART V.

THE HOME.

I. The House.....	131
II. Poverty	135
III. Alcoholism	143
IV. The "Lung Block".....	147
V. Preventable Conditions.....	153

PART VI.

PREVENTION.

CHAPTER	PAGE
I. Preliminary	159
II. Inhalation.....	160
III. Ingestion.....	168
IV. Inoculation.....	169
V. Marriage and the Offspring.....	171
VI. The School-Child.....	176
VII. The Adolescent and the Adult.....	183
VIII. Vaccination and Tuberculosis.....	189

PART VII.

THE CURE.

I. The Physician and the Patient.....	197
II. Fundamental Principles.....	199
III. Other Considerations.....	207

PART VIII.

THE MEANS OF CURE.

I. Tents and Other Outdoor Structures.....	213
II. Dispensaries	224
III. The Visiting Nurse.....	230
IV. Hospitals for Tuberculous Children.....	236

PART IX.

AMERICAN SANATORIA.

I. Preliminary	245
II. Saranac Lake.....	247
III. Other Sanatoria in New York State.....	255
IV. The Massachusetts State Sanatorium.....	262
V. Sanatoria Maintained by the United States Government.....	265
VI. Denominational Institutions.....	270
VII. Canadian Sanatoria.....	275

PART X.

EUROPEAN SANATORIA.

I. England.....	281
II. France	286
III. Austria.....	287
IV. Switzerland.....	288
V. Germany.....	290

PART XI.

THE SANATORIUM AND ITS ADJUNCTS.

I. The Sanatorium Idea.....	299
II. Hospitals and Homes for Advanced Consumptives.....	308
III. Farm and Open-Air Colonies.....	312
IV. Tuberculosis in Insane Asylums	316
V. Tuberculosis in Prisons.....	321
VI. The Financing of the Tuberculosis Situation.....	326
VII. State Insurance for Workmen in Germany.....	331

PART XII.

ADMINISTRATIVE MEASURES.

CHAPTER	PAGE
I. Laissez-Faire—Paternalism	339
II. The Health Department of New York City.....	341
III. The Tenement House Department of New York City.....	347
IV. Administrative Work in Other Municipalities.....	357
V. Communities without Health Boards	363
VI. State Jurisdiction.....	365
VII. Federal Jurisdiction.....	367

PART XIII.

NON-GOVERNMENTAL ACTIVITIES.

I. The Family Physician.....	373
II. Educational	376
III. Model Tenements.....	378
IV. Individual and Associational Enterprises.....	382
V. The Charity Organization Society of New York City.....	387
VI. The Baltimore Exposition.....	390
VII. The National Association for the Study and Prevention of Tuberculosis.....	394

PART XIV.

SCIENTIFIC RÉSUMÉ.

I. Early Diagnosis.....	399
II. Classification of Cases and Technique of Examinations.....	404
III. Pure Milk.....	413
IV. The Inspection of Milch Cattle and of Meats.....	420
V. Retrospect.....	428

PART XV.

SOCIOLOGICAL RÉSUMÉ.

I. Untoward Factors.....	433
II. Phthysiophobia	445
III. Consumption and Christianity.....	448
IV. Conclusion	451

Appendices

A. Disinfection.....	461
B. Tonics and Bitters.....	466
C. Hydrotherapy and Hardening.....	467
D. Extracts from a Children's Journal.....	470
E. Tents and Temporary Structures	472
F. Sanatorium Construction and Cost.....	490
G. Sanatorium and Dispensary Rules and Regulations, Schedules, Circulars, etc.....	498
H. Results of Treatment.....	507
I. Societies, Committees, Sanatoria, Special Hospitals and Camps, Dispensa- ries and Clinics.....	514

List of Illustrations

FIG.		PAGE
	Dr. Edward L. Trudeau's Sanatorium at Saranac Lake. . . . <i>Frontispiece</i> .	
1.	Robert Louis Stevenson.	32
2.	François Frederic Chopin.	34
3.	John Keats.	36
4.	Botticelli's Venus.	38
5.	The Beata Beatrice.	39
6.	Louis Pasteur.	50
7.	Robert Koch.	50
8.	Germ multiplication.	52
9.	Varieties of germs.	52
10.	Diagram of normal lungs.	56
11.	Miliary tubercles.	56
12.	Tubercles from child's lung, with bacilli.	56
13.	Cavities in lung tissue.	57
14.	Tubercular tissue converted into fibrous tissue.	58
15.	Cells with cilia.	59
16.	Consumptive father with apparently healthy infant.	61
17.	Hester Street, New York.	83
18.	Atmosphere in Hester Street, New York.	84
19.	Atmosphere at Madison Avenue and Sixty-sixth Street, New York.	84
20.	Deaths in Illinois, 1903.	90
21.	Mortality from ten principal causes.	91
22.	Deaths from consumption in Illinois, 1903, by ages.	94
23.	Proportion of mortality caused by consumption in New York City.	95
24.	Mortality among single, married, and widowed.	96
25.	Death-rates, white and colored.	100
26.	Mortality by races.	104
27.	Manhattan Borough, by wards.	109
28.	Mortality in European states.	110
29.	Mortality in principal cities of the world.	111
30.	Death-rate in various occupations (Brandt).	114
31.	Death-rate in various occupations (Hoffman).	118
32.	Air-shaft.	131
33.	A "dark room".	132
34.	A basement in the "Lung Block".	137
35.	A tenement-house workshop.	138
36.	Room in Philadelphia in which six died of consumption.	140
37.	Ground-plan of the "Lung Block".	147
38.	Signs of the times.	161
39.	A fire-escape.	200
40.	A rattan garden couch.	201
41.	An aerarium.	202
42.	Side view of an aerarium.	203
43.	Dr. Dunham's bed.	204

FIG.		PAGE
44.	A tent at Saranac Lake.....	214
45.	A Rush Hospital tent.....	214
46.	Prof. Fisher's tent.....	215
47.	Open-air shelter.....	216
48.	The Tucker tent.....	217
49.	The Tucker tent, interior.....	217
50.	Dr. Masten's tent.....	218
51.	A Ducker tent-house.....	218
52.	Revolving shelter.....	219
53.	Old street-cars as living quarters.....	220
54.	Interior of "lean-to".....	220
55.	A mountain home.....	221
56.	The Nathan cottage.....	222
57.	A tuberculosis dispensary.....	225
58.	Exercises at the country sanatorium of the Montefiore Home.....	240
59.	Boys at the country sanatorium of the Montefiore Home.....	241
60.	Sanatorium at Goerbersdorf.....	245
61.	Tubercle bacilli, with pus-cells, in sputum.....	246
62.	Saranac Lake in winter.....	247
63.	Dr. Trudeau.....	248
64.	Porch at Saranac Lake.....	250
65.	The Prescott cottage.....	253
66.	The Montefiore country sanatorium.....	257
67.	Women at the Montefiore country sanatorium.....	258
68.	A "lean-to" at the Loomis sanatorium.....	260
69.	Block plan of the Massachusetts State Sanatorium.....	261
70.	The Massachusetts State Sanatorium.....	262
71.	Taking the air.....	263
72.	Fort Stanton Sanatorium.....	266
73.	Tent at Fort Stanton.....	267
74.	Tents at Fort Stanton.....	269
75.	St. Joseph's Sanatorium.....	270
76.	Shacks at Muskoka.....	275
77.	A shack at Muskoka.....	277
78.	Sherwood Forest Sanatorium.....	282
79.	Dr. Dettweiler.....	291
80.	Dr. Brehmer as a young man.....	294
81.	The Brehmer Sanatorium.....	295
82.	Dr. Brehmer.....	296
83.	The Rhode Island Sanatorium.....	298
84.	The Agnes Memorial.....	300
85.	The Fourth of July at Bedford.....	301
86.	Men at Bedford.....	302
87.	Sun-bath at Sharon (winter).....	303
88.	Camp at Sharon (summer).....	304
89.	Camp at Sharon (winter).....	304
90.	Exercises at Bedford Sanatorium.....	305
91.	Sewing-circle at Bedford.....	306
92.	The Pottenger Sanatorium, Monrovia, California.....	307
93.	Inmates of Bedford Sanatorium at work.....	312
94.	The Y. M. C. A. Health Farm, Denver, Colorado.....	313
95.	The Nordrach ranch.....	315

FIG.		PAGE
96.	Tents on Ward's Island.....	318
97.	Revolving tent on Ward's Island.....	319
98.	Clinton Prison.....	322
99.	Cellar of a macaroni factory.....	349
100.	A hall and sink.....	350
101.	A hall and sink renovated.....	350
102.	Advertising sign before premises.....	352
103.	Advertising sign removed.....	352
104.	Bottom of an air-shaft.....	353
105.	New law court.....	354
106.	A living room.....	355
107.	A living room improved.....	355
108.	A roof pavilion.....	383
109.	Turban's scheme.....	407
110.	A history blank.....	408
111.	A monthly summary.....	409
112.	Diagrams of the chest.....	409
113.	Pasteurization of milk.....	413
114.	The Walker-Gordon farms.....	423
115.	A healthy cow.....	425
116.	A consumptive cow.....	426
117.	The Ulrich tent.....	474
118.	The Gardiner tent.....	475
119.	The Nordrach tent.....	476
120.	Details of the Tucker tent.....	477
121.	The Tucker tent.....	478
122.	Pavilion tent at the Metropolitan Hospital.....	479
123.	Ground plan of a "lean-to".....	481
124.	A "shelter," Rush Hospital.....	484
125.	The Lapham tent.....	485
126.	Dr. Biggs's tent-house.....	487
127.	The Nathan cottage.....	489
128.	The Prescott cottage (first floor).....	490
129.	The Prescott cottage (second floor).....	491
130.	The Prescott cottage (third floor).....	492
131.	The Maine Sanatorium.....	493

Part I

GENERAL CONSIDERATIONS

If thou, Lord, wilt be extreme to mark what is done amiss, O Lord,
Who may abide it?
For there is mercy with thee ; therefore shalt thou be feared.

CONSUMPTION

ITS RELATION TO

MAN AND HIS CIVILIZATION



CHAPTER I

INTRODUCTORY

Whilst meagre phthisis gives a silent blow :
Her stroaks are sure, but her advances slow.
No loud alarms nor fierce assaults are shown.
She starves the fortress first, then takes the town.

GARTH.

It is with a very real sense of melancholy that one contemplates the long death-roll of those of the world's great men and women who have succumbed untimely to the tubercle bacillus, which is and has been through countless generations by far the most potent of all death-dealing agencies. Had it not been for this detestable parasite, Bastien le Page might have given us another Joan of Arc to feast our eyes upon; Rachel might for many years have continued to permeate the spirits of her audiences with the divine fire that was in her. Our navy did well enough in the 1812 war, as all the world knows; but what a rip-roaring time there would have been if John Paul Jones had lived to take a hand in it. We might be reading more of Stephen Crane's splendid war stories; we might have had more of Robert Louis Stevenson's delicious lace-work; Schiller might have given us another "Song of the Bells"; we might have taken another "Sentimental Journey" with Laurence Sterne; Henry Cuyler Bunner might have continued to delight us, and to touch our hearts; John Keats might have given us another "Endymion." Had the tubercle bacillus permitted, Nevin might have vouchsafed us another "Rosary"; von Weber another "Euryanthe Overture"; Chopin might have dreamed another "First Polonaise"; and the tender flute notes of Sidney Lanier might even now be heard. Marie Constantinova Bashkirtseff, Xavier

Bichat, John Godman, René Théodore Hyacinthe Laennec, Henry Purcell, John Sterling, Henry Timrod, Artemus Ward, Henry Kirk White, Henry David Thoreau, Baruch Spinoza, John Addington Symonds, Prosper Mérimée,—such names as these are but a moiety among those of the world's nobility whose precious lives were cut off in their prime by the Great White Plague.

And our sense of resentment is by no means mitigated when we reflect that this bacillus is so minute that it was reserved for Koch, in our own time, with the aid of an exquisitely high-powered microscope, to discover it, and to reveal its life history and its habits and properties. It were indeed worthy the pen of a Heine to set forth how, although our mastodons are extinct, although we easily destroy all other visible brute creation, although we hold ourselves to be world-masters and universe-compellers, the race has nevertheless until our generation been impotent in the presence of an organism measuring in length one ten-thousandth of an inch and in breadth one fifty-thousandth of an inch,—an organism which multiplies so rapidly and so invisibly and insidiously that the consumptive, in coughing, emits several billions of it during twenty-four hours.

There would be no excuse truly for putting such sinister details as these before the laity were it not that the condition of things, which we term consumption or tuberculosis, is a tremendous, much-pervading human factor. I have intimated that of all death-dealing agencies, Koch's bacillus claims the greatest number of victims; the cholera, typhus, the plague of the middle ages, smallpox, are not in the running with consumption. The latter, although its ravages have not been so picturesquely grewsome, has claimed many more victims than any of the others; it has probably been coeval with human existence, and very likely has afflicted our primordial ancestors.

To-day every third or fourth adult dies of consumption. In the periods between birth and senescence every seventh death is caused by it. The point about these two propositions is this: Very few of us die merely of old age; almost every one dies of some disease or another, so that it would not seem to matter much what the particular disease might be that would carry us off. But, although all periods of life are precious—infancy and childhood and old age, as well as any other—it is during adult life that consumption achieves its fell work,—in the periods when young people should entertain wholesome anticipations of matrimony; when husbands should be strong to work for and maintain their families; when wives should have strength to rear their children, and when men and women generally should have physical and mental capacity so that they may accomplish the world's work.

No one knows better than the physician how truly touching may be the condition of things we are considering at the first of these periods,—the period of early manhood and womanhood, when poetry, music, flowers, sunshine, and the new-born instinct to love, and power to inspire love, are gloriously dominant; when sentiments ring true; when thoughts of compromise with unworthy factors, of subordinating ideals to considerations of interest, have not yet been conceived; when the love exists which welcomes sacrifices and feels that if it is ever to manifest itself, it should do so most gladly and most abundantly when the beloved is sorely stricken; the love that feels bound to triumph over all obstacles, and which snaps its fingers contemptuously in the face of fate. One is proud for human nature when such spirit is exhibited. Nevertheless it is then that this dreadful disease demands with deplorable frequency to be reckoned with. And it is then that the mature physician discerns the practical certainty that marriage, in cases where consumption exists or is suspected, will be followed by intensified illness, and perhaps death (which might not otherwise have occurred) on the part of the sick one; the possibility of infection of the healthy mate; the likelihood of unhealthy offspring, or of its early and perhaps, under the circumstances, fortunate death; and other indications suggesting disaster at the very beginning of married life, when all the circumstances, if any time in life ever requires it, should be favorable, and founded upon virility of mind and body.

The tubercle bacillus enters the body either with the air we breathe, or with tuberculous food-stuffs, or rarely through wounds. Wherever it implants itself an inflammation may occur about it, with the result that a tubercle is formed (*tuber* is Latin for root or bulb). This tubercle, at first microscopic, presently attains proportions from that of a millet-seed to a hickory-nut, or larger. Its development is termed tuberculosis. If the tubercle does not undergo "fibrosis" or some other innocuous process, such as we will consider, there is likely to become developed, through the agency of one or more "predisposing causes," the complex of symptoms which we call consumption. Probably no reader of this book will be fortunate enough not to recall among his familiars some sufferer from this disease. Those thus afflicted become progressively very weak and very much emaciated. Their hearts beat rapidly and they are apt to have a pink flush on their cheeks, which is quite unlike the blush of health, but which is in reality an indication of the fever that is consuming them. The rest of their faces is very pale and thin and is suffused with a clammy sweat. Their cheek-bones are prominent; and their eyes have a quite unnatural brilliancy, seeming large and

beautiful. But their lustre is not of health,—rather of disease, and too often of death. It is such eyes that the poet Bryant has portrayed in a touching and melancholy sonnet. And the consumptive spits blood sometimes, and is short of breath, and has a persistent, hacking cough, that harasses him dreadfully, and will not let him rest.

The reader is now likely to wonder how, with all these teeming billions of bacilli about, any one ever escapes the disease. The fact is, the bacillus allows very few of us to die without leaving some trace of its activity in our system. *Jeder mensch hat am ende ein bischen Tuberculose*, as Naegali demonstrated in 98 per cent. of the bodies which he examined on autopsy, of people who had succumbed to all sorts of disease, besides those dying of old age.

As has been indicated, there are two conditions essential to the development of consumption. In the first place, there must be the presence of the bacilli of Koch as its specific or essential cause. In the second place, the body must be predisposed to the disease by various unhealthful factors, such as vicious heredity, alcoholism, poverty, and the like. Most of us are able to resist the bacillus because our bodies are sufficiently strong to resist the organism, and because there are in our tissues certain germicidal properties which are ordinarily sufficient to cope with and destroy the bacillus. The layman will easily get the idea from the following experiment: Some rabbits were inoculated with tubercle bacilli and placed in relations generally deleterious to health; these became consumptive. Another group, selected from these same rabbits, were likewise confined, but were not subjected to infection, and these did not develop the disease. Whilst among a third group, which were inoculated like the first, but which were, on the contrary, favorably located as to hygiene, most of the rabbits escaped the disease.

CHAPTER II

EVOLUTION AND CONSUMPTION

We have as possibilities either Balance, or Elaboration, or Degeneration.—
LANKESTER.

AN exposition of the general trend of this book is here desirable with relation to certain tenets of the evolutionists.

The opinion is expressed, not frequently, but often enough to be entitled to consideration, that after all it were better for the race in general if its weaklings were left to die off; that efforts, for instance, on the part of the medical profession to save the lives of consumptives, especially of tuberculous infants, are essentially misdirected, for the reason that they are in violation of the natural law of the survival of the fittest.

Considered upon a purely physical basis this tenet of the evolutionist would seem to require that creatures who are unfit had best be left to perish, because their continued existence would be an additional and a useless burden for the strong to bear, and a handicap upon the development and progress of the fit. No doubt the Spartans thought thus when they threw their infants, unhealthily born, to the wolves, and from a purely physical point of view they were quite right. They considered, perhaps subconsciously, that the claims of the individual and those of the race here involved a contradiction, which were sensibly to be adjusted in but one way. To save a sickly infant would be contrary to communal hygiene, which would have for its ultimate object the improvement of the race.

Yet, we would not consider this tenet of the (physical) survival of the fittest to be indicative of evolution in all its phases, for it is, as here expressed, a tenet expressive of mere materialism. Evolution, to be a philosophy, an all-comprehending system upon which consistent living is to be based, must consider not only the purely material or physical, but all other aspects of life as well—the mental, the moral, the emotional, the spiritual—an evolution inclusive of the humanities. For no doctrine in philosophy is more certain than that the physical, moral, mental, spiritual, and all other phases of existence are inseparable, and mutually affecting and affected parts of the individual being. The most practical Gradgrind, the coldest political economist, the most austere statesman, will grant this, as well

as those most susceptible to the emotional: at least they will if they be men experienced in dealing directly with human conditions. If this view be accepted, a sympathy for the weak and the afflicted and a solicitude for their return to health and strength is altogether logical. Otherwise the conclusion is inevitable that civilization, the *wille zum guten*, altruism, Christianity itself, have been and are colossal mistakes.

If the broad view of evolution here set forth be accepted, who would presume to take it upon himself to discriminate, or to select from among his fellows "the fittest" for survival? Many a useful man, who has given substantial comfort to others, has been unhealthily born and has had his infant life hanging month after month upon a thread until the scale has been turned existenceward, with results vastly beneficial to his kind. The biographical dictionaries furnish the names of many a weakling who, having triumphantly grown to maturity, has impressed himself upon his civilization to its great good and profit.

However, even in the materialistic evolutionist's creed it is held somewhere, I believe, that there is in nature a constant struggle for the recovery of lost perfection, a struggle in which she much oftener succeeds than fails, in the long run, at any rate, if not in the first attempt. It has been well observed that in medicine this striving after lost perfection is as much a part of nature's healing power as is the force making for recovery in most cases of sickness. It is a common observation among physicians that weakly parents not infrequently beget strong children. We shall see that oftentimes tuberculous parents have born to them virile offspring, whose chances against consumption seem rather better than those of children of untainted parents. Before adolescence there are comparatively few deaths from tuberculosis,—the period when it manifests itself most and during which most deaths occur from it being between the fifteenth and fiftieth years. There is, then, a long period of latency in which, if the child be well nurtured, and if he live hygienically, he will be likely to overcome such tendencies to disease as he may have begun life with. Here surely are evidences of an upright and honorable offer on the part of nature to remedy untoward conditions. It rests with us to emulate her.

CHAPTER III

ANCESTRY. THE PRESENT LIFE. POSTERITY

For of the soul the body form doth take ;
For soul is form, and doth the body make.

EDMUND SPENSER.

I PURPOSE in this section the presentation of certain basic facts which are scientific in the present day, and some statements of philosophy which, when correlated, appear to me to furnish (confessedly to a distinctly limited degree) a contribution to the subject of existence after death. I believe that these facts and these statements will furnish a basis upon which the undoubted interest of humankind in a future life can be measurably accounted for. (I wish to emphasize the phrase "*a* future life." I do not purpose a consideration of the immortality of the soul of an individual after the death of his body. That momentous subject is as it may be, so far as this essay is concerned.) Such a presentation as this may not appear relevant to the trend of this work. I think, however, that it is; its relevancy lies in the fact that (with certain exceptions, to be dwelt upon later) a tendency to some diseases, and particularly to tuberculosis, may be transmitted from generation to generation; and that this tendency need oftentimes not be transmitted when there is an understanding of the physical agencies which foster it. The facts and statements I would set forth are the following:

From the biological view point, which is scientifically a correct one, conception, birth and death are but incidents in a succession of life processes. As regards conception, we observe that all life has its origin in a cell; and that at conception there is in the union of the sperm and ovum but the transformation of older cellular elements into a new cellular compound. Primarily, it is with the quality and properties of cells that we have to deal.

Again, the growth of the organism from the initial union of the sperm and ovum is simply a process of cell multiplication. This process advances in utero; and while in utero it advances in conformity with the maternal environment. Biologically speaking, the birth of the organism means simply a change of environment, so far as it is concerned; and not a very essential one, as we must conclude upon reflection.

Nor is the death of the body an abrupt and sudden change of conditions; in reality it is but a biological incident. For during every day of sentient existence some portion of the economy dies. Daily dying is an integral part of daily living. During the process of metabolism, by which existence is maintained, the body gives off its waste dead material, which returns to earth, and becomes useful—essential, indeed, in the processes of cosmic chemistry, to the development of other life. And at death, in the colloquial sense, dust has simply returned to dust, to aid the dust with which it becomes mingled in the fructification and nourishment of other existences.

Recognizing then that conception, birth and death are in the relation as stated, we may next consider certain conditions of the living organism, the human body, in the every-day sense of the term. Among all the various material elements, which are combined in the human organism, there is not one which has not been appropriated from the universe outside it. What we consider an individual body is but a subtle selection from among these external elements, made under the control of the mysterious and inexplicable force, thus far comprehended only by the dogmatist, which we vaguely term the vital principle, the breath of life, and the like.

The present day philosopher, in my opinion, understands the first cause, the essential origin by which these and other cosmic activities are achieved, no better than it has ever been understood. Nevertheless, with this limitation he has achieved a very comprehensive and most helpful grasp upon life. He has not explained for us *why* cosmic phenomena exist; but he has explained in great and almost adequate measure *how* these phenomena react upon one another, and particularly how external phenomena react upon the human organism. It is certain, as the monist teaches, that life is the constant adjustment of internal relations to external relations; that the body, in the various correlated activities of its organs and tissues, is constantly being affected by, and must respond to, influences from without, either physical or chemical in their nature. If these influences are wholesome, health may be expected, and a healthy body is the result; when they are unwholesome, in ways presently to be mentioned, disease is inevitable.

Now this human organism is dominated by a mind. The existence of this mind is a fact of human experience; to deny this is to deny that there is any such thing as living at all. *Cogito, ergo sum*, is perhaps the most palpable, the most absolute fact of all facts. And it is here where, having thanked the monist for the great help he has given us, we must take a different road than the one he has laid out.

He tells us that the mind, in its various aspects—reason, intellect, will, emotion—is but the outcome of purely material conditions. The beginning of living, of sentient existence, he tells us, was when the sun first shone upon and vivified a morsel of primordial protoplasm. Thus there was, to start with, a sort of amœboid, a unicellular existence, from which has evolved step by step through various more and more highly developed stages, the human organism, the most highly developed that we know of. However, this is by no means a complete explanation of the way in which the protoplasm became sentient. How did the protoplasm get there? we are entitled to ask; and how did the sun come to shine? The monist may answer that millions of years ago there existed atoms which under the pressure of gravitation became concentrated into nebulae, whence were evolved suns, whence in turn were evolved planets, upon which certain particles of matter, or accumulations of atoms, took the form of protoplasm, upon which the sun acted. Very well, then; but how did the primal atoms come into existence? And the monist may answer that these atoms were born or evolved out of a single space-filling ether. To this we may again respond, with tiresome persistence: Then how did the ether come into existence? And so on, as far back as the monist wants to go. The monist has not, in short, solved for us the mystery of mind. And the point I want to make is that although the body, through environmental stimuli, undoubtedly reacts upon and influences the mind, the latter is, nevertheless, essentially the dominant factor in life, and is, on the whole, master of the body with which it is associated. The presence of the physical brain is essential to the exhibition of mind; but brain is not mind,—it is the material machinery by means of which mind manifests itself.

And here the dicta of Kant concerning time and space are à propos. Time and space, he declares, are original intuitions of reason, prior to all experience; they are *a priori* intuitions, with which sensationalism has absolutely no connection; they are intuitions of reason in nowise dependent upon sensations; they are intuitions of reason absolutely unaffected by material conditions or environmental stimuli.

And are not these Kantian dicta correlated to the scientific statement that what is popularly termed the present life is but a link in a chain of life processes? And if, in accordance with the Kantian reasoning, time and space are intuitions concerning which it is impossible to conceive limitation, or epoch, or stages, or divisions, does not the same hold concerning physical manifestations in the universe? Is there not here a dualism of the psychic and the physical? And is it

possible, indeed, to dissociate the human mind in our conceptions from the human body; and since we cannot do this, is it possible that the conditions of illimitability and of boundlessness, which exist for the human mind, do not in equal degree obtain as regards the material human body?

It remains now to state one other scientific fact: that heredity is the biological law according to which living beings tend to repeat themselves in the offspring and to transmit to them their properties. We will here emphasize, as medical facts beyond dispute, that tendencies, at least, to such diseases as syphilis, asthma, alcoholism, insanity, epilepsy, and tuberculosis are transmitted by parents to their offspring, as are also many stigmata of an unwholesome sort, such as malformations, eye affections, deaf-mutism, anatomical aberrations, a scrofulous temperament, defective development of the heart and the arteries, anæmias, and many like indications of a baneful condition of living.

We are now, I think, in a position to make deductions.

As regards perverse heredity: What offspring is there that can honor a parent whose vicious life, or whose careless life, if you will, has resulted in the transmission of stigmata,—a parent who has foreknowingly given to his children a heritage of disease, of suffering, and of mortification? And what manner of man is he who wilfully, and with knowledge of possible consequence to his offspring, will live unhealthily?

Even those who suffer diseases innocently acquired, such as cancer, tuberculosis, and the like, would not escape reproach if they were to put themselves in a position where they would be likely to transmit their disease to future generations. Indeed, there is an anxiety, generally subconscious, but one nevertheless very potent, on the part of normal natures concerning the well-being of their posterity; and this anxiety we would emphasize regarding the disease with which we are here dealing.

It cannot be maintained, if the statements here set forth are sound, that no one has occasion to be interested in any other than his own present existence. In fact, we find that the present life is indissolubly linked, biologically and physiologically, with the past and with the future. Therefore the past and the future cannot be said to be of no moment to any individual. And it is these considerations which afford, I think, as cogent and as logical a basis for human interest in a future life as any that has been conceived.

I for one would not deny the claim of the emotional, the spiritual, the non-intellectual, to be authoritative. After all, what we know intellectually emanates in large measure from the unknowable.

Knowledge is generally but a consideration of phenomena (appearances). Perhaps the emotional and the spiritual are nearer reality than the intellectual and the practical. I would merely submit these definite, tangible data upon which, without an appeal to undemonstrable dogma, it may be reasonably concluded that no man's life is circumscribed between his physical birth and death.

It is evident these considerations are concerned only with *a* future life, not *the* future life of any given individual. In these times, indeed, there seems to be but little interest in the likelihood of such a continued existence as is represented in the phrase, "the immortality of the soul." Goldwin Smith voices this trend of thought in stating that after all no one really has an interest in a future life; that what is beyond the present is not vital to us; that whence we have come and whither we go are considerations which do not, after all, very much affect our conduct.

This is true, however, it seems to me, only in the sense that it is not the same life, not the particular soul, that is hoped to be immortalized; and certainly the biological facts here set forth do not warrant any belief in a perpetuation of the same individual consciousness. What they do warrant, however, is a vital interest in another life, whose welfare depends in large measure upon the condition of the being from which it emanates. This great humanitarian observes that "immortality is inconceivable. We must discard the term. The question is whether our hopes and responsibilities extend beyond this world and life. Conscience tells us that this world, its awards and its judgments, are not all, but that as we do well or ill in this life, it will be well or ill for us in the sum of things. What question can be more practical? Even taking it on the lowest ground, what would our social state be if vice and wickedness had only to bilk human law? Would not self-sacrifice be folly and martyrdom insanity?"

Do not the facts and philosophic statements here set forth reasonably attest these propositions? "That physical science has nothing to say to this matter is true." I hope I have shown that physical (or biological) science has in fact furnished a distinct contribution to the subject. "But is physical science," continues Goldwin Smith, "our only sure source of knowledge?" Indeed not. For physical science has to do essentially with phenomena; but when physical science affords us data upon which we may make reasonable deductions, the result is distinctly contributory to philosophy (the sum of all science, or knowing). Again: "There is in man something of which the materialist still owes us an account. All may be, and in a sense no doubt is, the outcome of physical evolution. That does

not seem to me to close the inquiry." Surely not. And being a physical scientist I should say, as a deduction from the statements I have made, that all is by no means the outcome of merely physical evolution. The materialistic deals with the phenomenal. The immaterial, the psychic, the spiritual deals, whenever it conforms with innate reason, with reality; and is to that degree a safer guide than the essentially and solely materialistic.

I may not further discuss this subject in its many impressive aspects: Teresianism, with its beautiful sentiment, "The heart hath reasons reason knows not of;" the tender Augustinian expression, which would suggest eternal kinship with a beneficent Creator, "I have come from my Father, and I shall not be satisfied or at rest until I return to him;" the ancestor worship and the belief in reincarnation of Oriental peoples; the eerie notions of little children, which would seem to savor of pre-existence; the anxiety on the part of good parents to give to their offspring a better bringing up than they themselves have had; and the like.

These general speculations concerning a future life have grown out of a desire to present logically the course through generations of pathological conditions in the human organism, among which tuberculosis is the one with which we have here to deal. With certain exceptions to be dwelt upon later, a tuberculous ancestry tends to tuberculosis in the living subject; and so may this pathological state be transmitted to one's posterity. The moral consideration, then, is that wherever there is such a tendency the conscience of the existent subject will prompt him to right living, so far as in him lies, in order that he may not transmit to the future life for which he is responsible a condition of body inviting to this dreadful disease, with all the agony of mind and distress of body which inheres to it.

CHAPTER IV

THE PSYCHIC ELEMENT

The spirit has all matter to choose from.—SCHOPENHAUER.

“WHAT’S mind? No matter; what’s matter? Never mind; what’s spirit? It is immaterial.” This is *Punch’s* system of philosophy, and certainly there is none more uncontroversial.

The manner in which the mind influences the body has been nearly as old a theme for speculation, no doubt, as the nature of mind itself. Nowadays there is evidently a trend in the opposite direction; the real, the important influence is held to be that of the body upon the mind, the body being itself acted upon by its environment. The reader has no doubt observed that in this book we by no means accept without reservation this view. Until we have discovered the nature of mind, and what matter is, until we have explained these ultimates, we cannot positively adopt either position to the complete exclusion of the other. However, in common sense both are intelligible. Evidently these two factors are conditioned upon one another—are essentially complementary. It is demonstrable that the mind impresses itself upon the body; and the present day psychologist has shown that the body reacts upon the mind. In the chapter on predispositions we shall further consider the latter of these propositions. In this section we shall dwell upon the former, particularly the influence of psychism with regard to tuberculosis.

It is indeed difficult to gauge such influence; to compute the extent to which thought can affect the development of a leucocyte, the making of a drop of lymph, or the behavior of an excretory cell. The process is not susceptible of investigation by the microscope or by laboratory methods. Nevertheless it is essential, notably in tuberculosis, that the influence of the mind upon the body be not lost sight of. It is in every one’s experience that mental perturbations derange the functions of various organs. Why may not acute shock, such as attends an accident, or chronic shock, such as accompanies nerve exhaustion, or overwork and anxiety, or a protracted play of profound emotions, predispose to graver affections? Indeed, it is an altogether scientific, practical procedure to note that the sympathetic nerve is an essential part of the machinery through which thought manifests itself; that passive congestion from any cause makes a tissue susceptible to

tuberculosis; and that sympathetic nerve aberrations constitute the likeliest factor to bring about such congestion.

Psychism in consumption is practically similar to that which obtains in every disease of long duration, in all chronic diseases. Every one must have observed with sadness that among his relations or his friends temperaments most stable, manly, engaging and lovable, have undergone changes during a prolonged sickness, especially if return to health seems unlikely. Such changes are well typified in some dispositions which become altered during the period when the autumn of life merges into old age. There is no better example of this than Conan Doyle's sketch of Corporal Gregory Brewster, so touchingly presented by Henry Irving in "Waterloo,"—how the old man, who had in his youth done an act of splendid courage, and who had been an epitome of manliness in his prime, whined fretfully to be fed, cried like a child when his pipe fell from his hand and was broken, and exulted that "Brother George never had such a pipe," when a new one was presented him. Upon awakening from a dreamy sleep, however, he lived again for a moment that thrilling act of courage done in his youth, throwing back his bent shoulders, his emaciated form erect, his eyes flashing fire, shouting with a voice once again resonant: "The guards want powder; the guards want powder, and they shall have it"—and then falling back dead.

The pathetic fact seems to be, with regard to tuberculosis, as in all things else, that all phases of individual life, the physical, the moral, the mental, the spiritual, seem intimately blended and interdependent, so that the whole is affected by an abnormality in any one aspect. We may here note that as regards the moral nature the consumptive differs in no way from other chronic sufferers.

The consumptive, however, as regards his psychism, has to contend with some factors which do not generally obtain in other chronic affections. It is no wonder he is sensitive, and that his sensitiveness makes him morbid, when others manifest fear because of his mere presence among them; look upon him as if he had committed some crime; are annoyed because of the cough and the expectoration compelled by his disease.

We might here adopt the old classification of mind (Tuke) into will, intellect, and emotions. The will, as all other mental aspects, is unstable and variable; however, there is sometimes an extraordinary optimism. The intellect is often acute; and sometimes it is oddly uncanny and *outré*. The emotions of consumptives are very varied. Ecstasy, impulsiveness, obstinacy, irritability, abnormal energy, alternate with depression, grief, disappointment because of non-improve-

ment, such as has been hoped for ; fear and anxiety concerning their condition ; mortification because of the attitude toward them of people in health ; shock upon learning from the physician the disease from which they are suffering ; homesickness among those in sanatoria ; religious gloom, and perhaps terror, and the like.¹

¹ Cornet and Flick have notable contributions upon this important subject.

CHAPTER V

LITERATURE AND THE ARTS

Trockner Husten, todter Trompeter.—GERMAN PROVERB.

It's a great chance, we find, to arrive to one's grave in this English climate, without a smack of a consumption, Death's direct door to most hard students, divines, physicians, philosophers, deep lovers, zealots in religion.—GIDEON HARVEY (1672).

It appears to me that the quality of the genius of a great man, if he be consumptive, may be, in some cases at least, affected by his disease; perhaps this is due to the effect upon the nervous system of the toxins evolved in the body by the bacillus—a weird condition, certainly. Robert Louis Stevenson's work would best illustrate, I think,

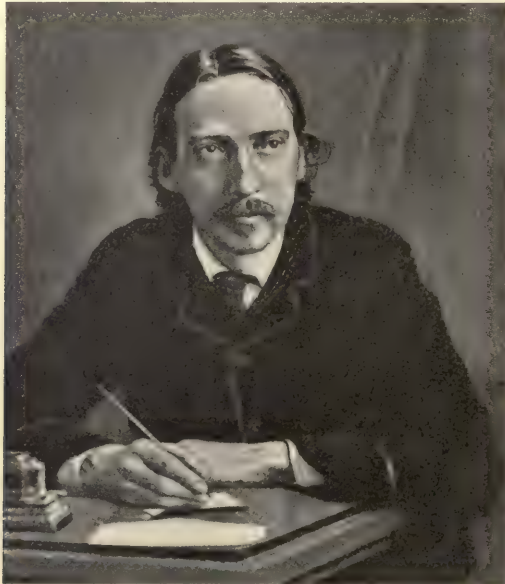


FIG. 1.—Robert Louis Stevenson.

this phase of the subject. Perhaps in his case this quality of genius to which I refer may be temperamental, and would have appeared equally if he had never been a consumptive. Certainly there are no more fascinating contributions to literature than this man's works. I touch upon certain passages. For instance, in the "Master of Ballan-

trae," the man who pretended death and was buried, and who, following an imagined Oriental custom, "swallowed his tongue," remained for months beneath the ground, and, on being exhumed, manifested a gasp and a sound in the throat, showing that a spark of life still remained.

In *Treasure Island*, the reading of which has at least half a dozen times kept me up until well into the morning, there is the weird touch of the dreadful blind pirate, his quick, sharp footfalls coming nearer and nearer the inn in which the frightened boy lay, how he kept constantly tapping the hard pavement with his walking-stick in the clear, cold moonlight night,—an incident in literature similar in its psychology to Beethoven's "knocking of fate at the door" in the Fifth Symphony. Then again the way Long John Silver, the man with the wooden leg, killed the sailor in the woods of *Treasure Island*,—how, as the sailor walked away, Long John balanced himself by grasping the branch of a tree overhead, on the instant got off his wooden leg, let drive with it so that it struck the sailor square in the spine; how then Long John hopped quickly to the prostrate man, and finished the job with a knife-plunge in the back—an uncanny incident, certainly.

In the *Bottle Imp* there is that of the two men viewing the bottle, made of iridescent glass, within which could be seen some strange thing moving about,—how, his curiosity being too much for him, one of the men for an instant uncorked the bottle, and how, after a glance within, his face grew ashen and from that moment he was a sick and stricken man.

Dr. Jekyll and Mr. Hyde is full of such strange touches as these, especially that ghastly turning of the benign face of Dr. Jekyll into the hideous face of his devil nature in the upper story window of a calm Sunday afternoon. There is surely here some sort of literary pathology manifested.

In the realm of music Chopin has produced some so ravishing that it has been said: "It is wrong to produce music so exquisitely beautiful, of a beauty rather supernatural than of the earth." And again it has been truly said that after a piano concert devoted wholly to his compositions, the virile, normally masculine element has been found so lacking in them that one would wish to shout, to run, to do some feat of strength by way of establishing equilibrium. Much indeed of almost spectral beauty there is in this man's work, suggesting too insistently the white moonlight and exotic atmospheres. What mortal indeed will ever again, unless in a dream, hear such exquisite music—music supernatural and not at all of the earth—as that in the trio of the First Polonaise; or such plaintive melody, which sounds as if the

composer were communing with spirit creatures, as is to be found in the Nocturne (opus 37)? And that duo waltz passage (opus 42), which sounds as if it were the wailing and the sighing of the spirit lovers whom Dante immortalized. Nowhere else in music—not even



FIG. 2.—François Frederic Chopin.

in the deaf Beethoven, nor in Tchaikowski, saturated with the dreadful melancholy of the Slavonic race—appear such eerie harmonies, such strange phrases in sixths, such tender, heart-searching music as is characteristic of this composer. Nowhere else in music, perhaps, is there quite such as this. Is it in some measure because during the last ten years of his life—the most productive years, I suppose—poor Chopin was a consumptive? I have sufficiently elaborated my observation, however, in the examples of these two great men. I do not pursue the subject further, having no heart to mutilate the idols of my readers. Certainly what I have conceived concerning their genius in nowise decreases my affection and my gratitude for their works.

Marie Bashkirtseff exhibited so many characteristics, such as are touched upon in the preceding section, that the disease from which she suffered certainly would appear to have impressed itself upon her temperament and her genius. Concerning her, Gladstone bade us be

careful how we deal with these same "abnormal beings, who seem to warn us common mortals, how we handle them roughly or lightly; because they are above and beyond us, our arms do not encompass them." From this point of view, considers a critic, "we may perhaps find in her not alone that which repels, and is to be dreaded and shunned, but that which supremely attracts, which animates and inspires us,—so glowing and redundant a vitality that our own faculties are intensified, our perceptions quickened, and our energies reinforced. Centred in self as she was, there revolves around Marie a whole world of possibility and suggestion,—a world that is so often blank and inert to our dull sense, but that to her was luminous, plastic, and full of revelation; visions of beauty beckon and invite her, lovely sounds woo her, and on all sides she is called out to the infinite. Like an Æolian harp, her resonant nature vibrated at every touch. Art, music, books, nature, the whole gamut of the emotions swept over the strings that rang and finally snapped with the effort to express the ardent, concentrated, insatiable individuality that burned within her." Truly this critic had understanding.¹ In this same volume is set forth her affection for and kindness to Bastien le Page, whose death followed a few weeks after hers, and was due to the same disease. When he was too ill to walk he was often carried to her house, where they lay, stretched out on two lounges, silent, dull with pain, letting their young lives drift away, "seeming to have no outlook, no hope, and at the last no apparent desire for another and a purer, more ideal life." This poor young woman died in her twenty-fourth year.

We may here introduce, as it were, a scherzo in a sonata otherwise sombre enough,—Joseph Jefferson's story in *The Century*, how he advised Artemus Ward, who was not in good health, to be careful lest the kindness of London should kill him. "On no account, in his delicate state of health, was he to expose himself after his entertainment to the pernicious effects of a London fog. But he was weak and yielded to the influence of his many admirers. So his career was brilliant and brief. He had that unfortunate desire for the second round of applause, that is so fatal to the health and position of an actor." He died not many months after his London *début*, attended to the last by Tom Robertson. A strong attachment had sprung up between them, and the devotion of his new-found English friend was touching in the extreme and characteristic of Robertson's noble nature. Just before Ward's death, Robertson poured out some medicine in a glass

¹ *The Century*, May, 1890.

and offered it to his friend. Ward said, "My dear Tom, I can't take that dreadful stuff." "Come, come," said Robertson, urging him to swallow the nauseous drug, "there's a dear fellow. Do now, for my sake; you know I would do anything for you!"

"Would you?" said Ward, feebly stretching out his hand to grasp his friend's, perhaps for the last time. "I would, indeed," said Robertson.

"Then you take it," said Ward. The humorist passed away a few hours afterwards.

Of Keats is here reproduced a portrait, from a sketch made by Joseph Severn in 1821. It was in his last illness, and underneath it

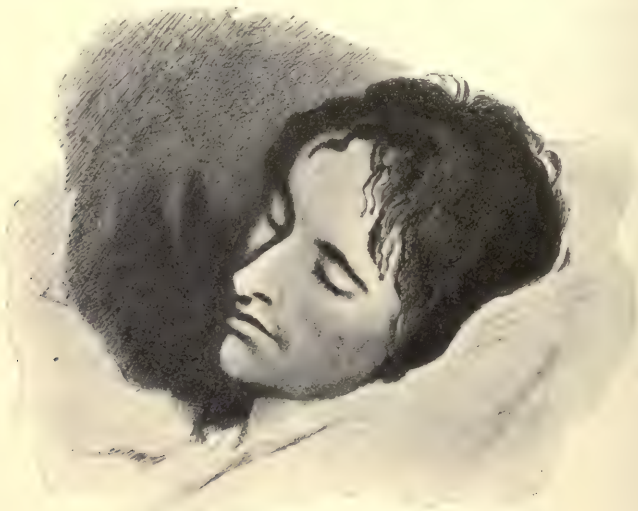


FIG. 3.—John Keats.

is the legend: "God bless you, my dear Brother and Sister. Your ever affectionate Brother, John Keats." Did ever a man feel the "Weltschmerz" as did Keats? Nothing can be added that would enhance the poignant sadness inherent in his face. Severn made his portrait of Keats in his youth. He died fifty-eight years after his illustrious friend.

"Henry Timrod's life was so heartbreaking that one finds it hard to linger over it. The reader is constantly reminded of the cumulative sadness that was the lot of Keats." He had also Keats's sensibility of temperament, his sensitiveness to outward influences. Both these men suffered physically in the same way. Surely it was a sad time in the South. Timrod was born in Charleston in 1829. War was beginning to loom ominous. Timrod's muse was not for stirring

things, but for repose, for graceful love songs, for lyrics in praise of spring and woodland. "It was not time for music, and Timrod was not one to draw the gaze of busy men. Later, when the fever of war heated his verse, men carried his stirring songs in their hearts, but forgot the singer. Later still, when they came back crushed and heartbroken, yet ready to take up manfully the struggle of life anew, it was still less the fortunate hour for the poet." The stress of poverty bore much on Timrod, and even in his sixteenth year his illness impressed itself upon him. He loved nature and the lonely and cloistered life he led in green fields and woods at this time. "He always remained a child; yet he was a child only in his inability to cope with the hard conditions that beset him. In his mental attitude toward life he was manliness itself."¹

I hold always in affectionate remembrance a patient and a friend, originally a Marylander,—a tall, thin, gaunt man, saturated with bonhomie, and with a countenance of extraordinary gentleness. He had been a newspaper man in New York City, and his "stuff" had been much in demand at one time in various papers—the sort of work that appears in the Sunday issues—not reporting, but the writing of stories and the like. His strong point was comic verses, children's stories, and the manifestation of much kindly, natural humor. In the course of time he contracted consumption, as others in his family had done before him. A profuse hemorrhage one night greatly frightened him, and he went away from New York for a time, spending most of his money in trying to regain his health. But he did not do well, and returned to New York to earn sufficient to recoup his fortunes. He did not succeed as well as before he went away. As is often the case in newspaper work, his "stuff" did not go as well as it had formerly done. So week after week for a number of months he was in want. During the visits I directed him to make to my office, his conversation was a most pathetic intermingling of pessimism with genial and amusing anecdotes. I happened once to touch upon the Civil War,—and never repeated the mistake. He was of a very old family whose proclivities had been warmly Southern. He became excited and spoke most bitterly against the North. His had been since Revolutionary times an honorable people, gentlemen and gentlewomen; their plantations had been conducted most wisely, and had yielded them great wealth, which they had dispensed judiciously and liberally, so that no human being within their ken, no dog indeed, needed any wholesome thing in life; their slaves had been treated with the utmost humanity

¹L. F. Tucker, in *The Century*, February, 1881.

and had been devotedly attached to them; no man could pass through that country without experiencing, at least for a night, their kindly and generous hospitality. But Northern carpet-baggers, unscrupulous men, tricksters absolutely devoid of the instincts of gentlefolk, and to whom the meaning of the word honor was impossible of conception—despicable victors, who recognized no other right than the might they represented—had come into his country, had made the former slaves discontented and unhappy, yearning again for the old order of things; had destroyed his family estates, and made them devoid of fruition and unprofitable; so that his family, once rich and munificent, was now without means. In such manner did my dear friend inveigh; coughing, sweating, trembling the while; I doing my utmost to calm him, fearing a fatal issue even while he was speaking.

Well, he had been working upon a novel, the publication of which he felt sure would get him money and regain for him his rightful position. . He worked steadily at this, while I could see he was getting as steadily sicker and weaker. One day, the saddest of all, he told me a very good publisher had pronounced his novel excellent, and that it would be accepted if he would go over it thoroughly once again, making certain changes. But this he had not strength left to do. He went South from New York after telling me this; and there, in a few weeks, he died. What has become of his novel I know not; it would have had at least one appreciative reader.



FIG. 4.—Botticelli's "Venus."

Tuberculosis has exerted no little influence upon the plastic arts. Dr. Hillier gives instances to this effect. Consumptive models

have inspired some great paintings. Simonetta Catanea, who sat for Botticelli, died of consumption at an early age. In his "Venus" the artist has faithfully, if not intentionally reproduced the sunken cheek, the long, slender neck, the steep, sloping shoulders. And the model most frequently engaged by Dante Gabriel Rossetti, a modern disciple of Botticelli, was also a consumptive. Many of his paintings "have that expression of suffering which is undoubtedly phthisical in origin. A certain sweet sadness which attaches to these pictures is due to

phthisis in the models. It is the appealing sadness of disease, and not the splendid natural beauty of health, as symbolized in the Venus de Milo."

Literature and the arts have indeed given many hostages to consumption. In all the ways in which genius works—in the plastic arts, in verse, in romance, in poetic prose, on the stage, in music, both original and in the sympathetic faculty to interpret by song and instruments the outpourings of the composer's soul—how recklessly have such spirits despised the pains and the wants of the physical body, how generously and with what open hearts have they given to the world of their real selves, of all things universal the most valuable and the most imperishable! One would think that in return for such precious gifts, the world would at least see to it that these benefactors should have no need of bread and sustenance. But how often have they perished for want of these things. How little, indeed, has the world, in any case, given them in return,—the sordid world, that counts little of value which has not tangible form and which cannot be seen and eaten and put to material use. Strange irony of fate that those who love best the flowers, the expanding landscape, the kine in the fields, the pure air of heaven, the good, rich red wine of life, the pantheistic sunset—that those who love most to live and know best how to appreciate reality—must earliest succumb!



FIG. 5.—The Beata Beatrice.

CHAPTER VI

HISTORICAL

The most dangerous disease, and the one that proved fatal to the greatest number, was consumption.—HIPPOCRATES.

FROM time to time in the history of mankind some one disease or another has popularly been looked upon as the universal scourge. Thus has the Wandering Jew personified the cholera, which in various eras swept away enormous numbers. Dr. Hecker's book on "Epidemics in the Middle Ages" reveals how like a blighting spectre the Black Death stalked through three continents. Before the beneficent discovery of Jenner smallpox had destroyed vast numbers of lives, so that oftentimes cities and towns were much more than decimated, and villages were swept entirely out of existence; so that every other person met upon the thoroughfare would be a pock-marked survivor. The congener of such diseases as these in the present day is tuberculosis; and it is as certain as any human fact that such has been the case from time immemorial. It is likely to have had an existence at least coeval with man; that our primordial ancestors, indeed, were afflicted by it in remote and nebulous ages. To-day the simian suffers from it probably more than does any other living thing.

The physicians of all times, Hippocrates, twenty-five centuries ago, and after him Galen, Celsus and others, had to contend with the Great White Plague, as we have to to-day. Its ravages have not exhibited so terrible an aspect, nor have they been so grewsomely picturesque; nevertheless this insidious disease has always been far preeminent as regards the number of its victims. It has undoubtedly been more destructive than the sword to human life.¹ It does seem odd, for instance, that in a city like New York an epidemic, say of smallpox, which may involve the deaths of a mere handful, will create a prodigious panic, while consumption, which in this city destroys every year more than ten thousand in the most productive periods of life, receives comparatively so little attention. Only the other day it was reported that one man died in the Bronx Borough of smallpox. "There were three hundred or more people living in two adjoining tene-

¹ Richat estimates the death-roll of all the wars of the nineteenth century at 14,000,000, and that of consumption in the same period and countries at 30,000,000.

ments, and they were exposed to the contagion for fifteen or twenty days." Our Health Department at once sent its physicians, who found the street in which the death occurred crowded with excited men and women, many of whom dared not go home for fear of contracting the disease.

Then followed a scene, the description of which is corroborated by that of many a historical incident. The physicians prepared at once to vaccinate all within the sphere of the contagion. The tenants, mostly women and children, were very uneducated and were of all nationalities, mostly Italian; and there was generally a superstitious horror of the proceedings. Here and there frightened people fought fiercely and had to be roughly handled before they could be vaccinated; many submitted only upon threat of arrest and imprisonment. The neighborhood was greatly excited over the news that one individual had died of small-pox, "and the police had to deal with a kind of panic."

If a case of bubonic plague, or of yellow fever, or asiatic cholera, were to develop in New York City there would be newspaper "scare-head" extras, and the greatest alarm would be felt; and business and traffic to the city from the surrounding country would certainly be demoralized. Yet, as we have noted, but little attention is given to consumption, a disease much more deadly than all of these put together, and much more inimical to human happiness. The terrible Black Death lived one year in London; it killed fifty thousand. Consumption kills in the world at least 5,000,000 yearly; in England and Wales alone more than sixty thousand a year. And of all deaths in the United Kingdom between the ages of twenty-five and thirty-five nearly one-half are due to this disease.

And all this is so great a pity, because consumption is a disease so easily preventable; and in most cases curable. And though death-rate statistics are impressive enough, still more so are the connotations of sufferings antecedent to death, of the periods of illness in the cases of the vastly greater number of the phthisical who have recovered, and of the hardships visited upon the families and friends of the afflicted.

Among the early Greek physicians there were those who recognized the infective nature of tuberculosis. For instance, a physician of the time of Aristotle asked: "Why are those taken by phthisis, who are brought in contact with the sufferers, and not taken by such diseases as dropsy, fever and apoplexy, however close the contact with sufferers from this disease may be?" Phthisis, continues this physician, is obviously infectious, because it spoils the air and makes it

heavy, and thus others become infected. That such views as these were generally prevalent may be gathered from a speech by Isocrates, who based the claim of his client to inherit his father's estate on the fact that he had nursed him whilst suffering from phthisis, although his friends had dissuaded him, saying that most of those who nurse in this disease themselves succumb to it. Galen clearly held that phthisis was an infective process, and that it was a danger to live with those who suffered from it. Aphrodiseus declared that the phthical patient sends out during the expiration bad air, which, being rebreathed by a healthy person, would in turn convey the disease to him.

But Aritæus the Cappadocian (50 B. C.) left a description of the consumptive which cannot be improved upon in the present day. It is here reproduced :

“Voice hoarse, neck slightly bent, tender, not flexible, somewhat extended fingers, slender, but joints thick; of the bones alone the figure remains, for the fleshy parts are wasted; the nails of the fingers crooked; the pulps are shriveled and flat, for, owing to the loss of flesh, they neither retain their tension nor rotundity; and, owing to the same cause, the nails are bent, namely, because it is the compact flesh at their points which is intended as a support to them; and the tension thereof is like that of the solids. Nose sharp, slender; cheeks prominent and red; eyes hollow, brilliant and glittering; swollen, pale or livid is the countenance; the slender parts of the jaws rest on the teeth, as if smiling, otherwise of a cadaverous aspect. So also, in all other respects, slender without flesh; the muscles of the arms imperceptible; not a vestige of the mammæ; the nipples only to be seen; one may not only count the ribs themselves, but easily trace them to their terminations, for even the articulations of the vertebræ are quite visible; and their connections with the sternum are also manifest; the intercostal spaces are hollow and rhomboidal, agreeably to the configuration of the bone; hypochondriac region lank and retracted; the abdomen and flanks contiguous to the spine; joints clearly developed, prominent, devoid of flesh; so also with the tibia, ischium and humerus; the spine of the vertebræ, formerly hollow, now protrudes, the muscles on either side being wasted; the whole shoulder blades apparent like the wings of birds. If in these cases disorder of the bowels supervenes, they are in a hopeless state. But if a favorable change takes place, symptoms the opposite of those fatal ones occur.”

During the Dark Ages Europe was essentially dominated by an unholy theology which required absolute submission and adherence to the teaching that plagues and epidemics were visitations of an angry

God; and the tendency of this theology was to suppress a rational investigation of the causes of disease, such being held to be a sort of sacrilege. As if indeed a just and merciful God would cruelly torture and destroy his own creations, which must appear to an omnipotent Creator (humanity must always have appeared to him thus) so pathetically helpless and innocuous; as if reason and the ascertainment of knowledge were not states of the human mind as essentially God-given as any other, to be employed as conscientiously as any other; as if the use of these wholesome faculties were in any way incompatible with the possession and exercise of the deepest religious sense. Thus it was that many millions of lives were destroyed which might otherwise have been saved; and, what will even much more appeal to the consideration of the humane, infinite wretchedness and infinite pain could have been alleviated had it been possible to apply scientific measures to diseased conditions.

However, let those who would consider this spirit of intolerance toward scientific research to have passed away, reflect upon the anti-vaccination movement which, in the most civilized communities, seeks to prevent the slight and harmless procedure, by means of which one of the most dreadful of scourges has been rendered practically obsolete. Moreover, the Health Boards of large cities have very great difficulty in enforcing the simplest sanitary regulations, not only among the poor and ignorant, but even among those who exhibit in most other matters the possession of elemental common sense.

Then there are the pseudo-religionists of the present day, typified by the "Eddyots," who are causing much cruel suffering and many unnecessary deaths by their insistence upon the disregard of the simplest principles of sanitation; some members of the community oftentimes becoming victims of the infection thus propagated.

The candid student of history must admit that during the darkness of the Middle Ages in which Europe was enveloped, Mohammedanism exhibited a scientific enlightenment, the spirit of which is not excelled in modern civilization. There was among them a wonderful development in nearly all the arts and sciences; and among the brightest jewels in this intellectual crown was Saracenic medicine. We may refer here only to Avicenna, the Arabian (1037),¹ who, like the best observers of antiquity, had definite ideas regarding the infectivity of consumption; he referred to "many diseases which are taken from man to man, like phthisis."

¹ From the excellent book on "Consumption," by Dr. Hillier, to whom I am indebted for many of the data contained in this chapter.

After the Renaissance, dissections were permitted and anatomy and pathology came to be more carefully studied throughout Europe, and in the middle of the seventeenth century tubercles or nodules were found in the lungs and first described. The connection between such tubercles and phthisis was first demonstrated by Silenius, the Italian (d. 1672).

In the seventeenth century classic, "The Practice of Physic by Lazerus Riverius," published in London, the following appears: "Moreover, there are external causes (of phthisis), as contagion, which is the chiefest; for this disease is so infectious, that we may observe women to be infected by their husbands, and men by their wives, and all their children to die of the same; not only from the infection of their parents' seed, but from the company of him that was first affected. And this contagion is more easily communicated to them that are of kin, wherefore it is not safe for a brother or sister to enter into the chamber, for the miasmata, or vapors infective, which come from the lungs and infect the whole air of the chamber, and being drawn in by others (especially if they are in any way disposed to the same disease) beget the same disease in their lungs."

Morton in 1689 taught that the tubercle was the pathological evidence of the disease in the lungs. And the idea of the infectivity of consumption was developed by the anatomists, especially the Italians Valsalvi and Morgagni. Under the influence of the latter, laws were made concerning the spread of phthisis which reflected the spirit and understanding of the Italian people of that time. In 1754, for instance, the sanitary magistrate of Florence asked for an expert opinion from the Florentine Medical College as to what articles would be most likely to be infected from the presence of a phthysical patient, and what means could be adopted to purify them. Antonio Cocchi therefore advised that phthysical patients who lived in large airy rooms exposed to the rising or midday sun, especially during the winter months, do not require more than that their rooms should be well cleaned and always purified by opening the windows as wide as possible. But phthysical patients were not in any case to be put in stuffy rooms with doors and windows shut, for still air increases the amount of putrefaction and makes it more dangerous to others. The sick should only spit into vessels of glass or dried porcelain, which should be frequently and thoroughly cleansed. All the small rooms were to be thoroughly whitewashed, but in large rooms it was sufficient to whitewash up to a little above the height of a man. This advice, which reads almost like a circular of to-day on the subject, was the basis of an edict concerning tuberculosis, issued in 1857.

The spread of the popular belief in the infectivity of phthisis may be inferred from a statement of Nocard that in 1750 the property of a woman who had died of consumption, after having occupied the bed of another consumptive, was publicly and officially burned in the market place of Nancy.

The present day tendency with regard to the separation of phthisical patients in hospitals had its forerunner in 1760, when a hospital was erected in Olivuzza for the special accommodation of phthisical patients, who were moved there out of other hospitals in order that they might not spread the infection. The modern sanatorium is based upon much the same idea.

In 1782 an edict was issued at Naples ordering the isolation of consumptives and the disinfection of their furniture, books, etc. Except for its historic atmosphere, this decree is in substance much like a circular issued by a modern health board. Thus: "The Deputies in this capital and the Governors or Locum Tenens in the Provinces should, immediately after the burial of a phthisical patient, be sure to have his rooms cleansed, the floors, wainscoting and ceiling renewed, the wooden doors and windows scrubbed and cleansed, and fresh plants introduced in order that the corrupt and infectious atmosphere may not be communicated to persons who live near; also that they should make use of any other precautions which physicians use in like cases." Again: "The Governors and Directors of the Hospital are ordered to keep apart the clothes, linen, etc., for the use of persons infected with this disease, that they shall be burnt, even in cases of cure, and that to provide new clothes shall be the business of the administration in cases of poverty."

The following penalties were imposed in this decree:

"Those who oppose the officials making their inventories, isolating or removing the clothes to the crematorium, and the cleansing of the places where the patient died, shall be sentenced to three years at the galleys or prison according to the condition of the person, and shall have three years imprisonment and three hundred ducats fine." Pity these things cannot be done nowadays to a few Christian Scientists, Dowieites, and the like, without regard to personal conditions! Again: "Regarding physicians who do not reveal the nature of the illness, they shall undergo a fine of three hundred ducats for the first offence, and for the second ten years' exile." Again: "Those who buy an infected robe shall have three years at the galleys, and those who sell three times the value of the robe sold, as a fine." "Those relations who refuse to send an infected person to a hospital, or remove such an one without the knowledge of the Officer of Health, shall have

three months' imprisonment if of low birth, or three hundred ducats if noble."

In Spain and Portugal laws were also enacted providing for the disinfection of the clothes, beds, etc., of consumptives after their deaths. For instance, in 1839 George Sand wrote, in a letter, of Chopin, with whom she was travelling, and who was already consumptive, although he did not die until some ten years after, thus: "Poor Chopin, who had had a cough since he left Paris, became worse; we sent for a doctor—two doctors—three doctors—each more stupid than the other, who started to spread the news in the island that the sick man was consumptive in the last stage. As a result there was great alarm. Phthisis is rare in these climates, and is looked upon as contagious. We were regarded as plague-infested; and, furthermore, as heathens, as we did not go to the mass. The owner of the little house which we had rented turned us out brutally, and wished to bring an action against us to compel us to limewash his house, which he said we had infected. The law of the island plucked us like chickens." At Barcelona, as they were leaving the inn, the landlord demanded to be paid for the bed on which Chopin had slept, on the pretext that it was infected and that the police regulations required that it should be burned. Fortunately, the science of to-day does not countenance such radical measures.

In 1803 Chateaubriand wrote in Rome to a friend of the death of Madame de Beaumont: "I am in a great difficulty; I had hoped to get 2000 crowns for my carriages, but, by a law of the time of the Goths, phthisis is declared in Rome a contagious disease, and as Madame de Beaumont drove two or three times in my carriages nobody is willing to buy them."

Concerning the history of the modern treatment of this disease, Latham instances the letter, in 1747, of "a Scotch physician," whose name is unknown, in which he clearly asserts to his London colleagues, upon the incontestable evidence of the results he had obtained, that hygiene and diet are the most important means of cure and that climate and medicine are but more or less precious adjuvants. Nevertheless, until fifty years ago both the public and most physicians regarded consumption as incurable. It was written in 1815: "Even with the utmost powers of art, perhaps not more than one case in a hundred will be found curable." And in 1867 Ullesperger called attention to the fact that up to that time barely two hundred cases of cured, or what we should now call arrested tuberculosis, were to be found in medical, as distinct from pathological, literature. A French writer, somewhat more hopeful, observed: "There are two kinds of

consumption,—that of the rich, which is sometimes, and that of the poor, which is never, cured.” The efforts of medical men had been directed toward the comfort of the patients rather than the arrest of the disease. All cases, even those regarded as being in danger of contracting consumption, were wrapped up in heavy clothes, kept in a hot-house atmosphere and jealously guarded against exposure to the fresh air. We shall see by what means, and how triumphantly the experience of the past is reversed in the present day.

With regard to modern scientific researches: The physician Laennec, who himself died of consumption in 1826, was an exhaustive student of the disease; he declared that phthisis followed upon the formation of tubercles in the lungs. Up to the time of Klenke, in 1843, the views which were held concerning the infectious nature of tuberculosis were not based upon direct experiment. He injected tubercular matter into the jugular vein of a rabbit, and six months later found tuberculosis in its liver and lungs. And in 1865 Villemin also demonstrated that tuberculosis was a specific disease caused by a specific agent. By injecting tuberculous material from a phthisical patient beneath the skin behind the ears of a previously healthy rabbit, he obtained as a result the development of tuberculous nodes in this animal; while, on the other hand, if he inoculated non-tuberculous material, no signs of tubercles were produced.

But it was reserved for Robert Koch, of Berlin, in 1881, to discover the bacillus which he demonstrated to be beyond peradventure the specific cause of tuberculosis.

Part II

THE SPECIFIC CAUSE OF TUBERCULOSIS

In 1882 Robert Koch announced to the world his discovery of the tubercle bacillus. His paper on "The Etiology of Tuberculosis" (probably the most far-reaching in its importance to the welfare of the human race of any original communication), based on experimental research, at once threw a flood of light on the darkest page in the history of medicine, a light which revealed the microscopic fungus which is the direct cause of tuberculosis, gave a new impulse and opened a new horizon to medical thought.

TRUDEAU



Fig. 6.—Professor Louis Pasteur.



Fig. 7.—Dr. Robert Koch.

CHAPTER I

GERMS

But the great fundamental advance which signalizes the past decade is the lifting of this whole class of fateful germ diseases out of the region of the intangible and mysterious, and their establishment, on the basis of positive experimental research, in the domain of the comprehensible and definite. The things which cause them are no longer for us mysterious emanations from the sick, or incorporate expressions of malign forces against which conjurations or prayers could alone promise protection. But they are particulate beings, never self-engendered, never evolved in the body, always entering from without,—things which we can see and handle and kill.—PRUDDEN.

WHEN, a few decades ago, the microscope was brought to a degree of development approximating its present well-nigh perfect state, the study of an extraordinary phase of cosmic life became practicable. It was revealed that there are germs, or bacteria, or microbes, or microorganisms, invisible by ordinary sight, without whose activity living would be altogether impossible; and it was Louis Pasteur who first developed the knowledge of these things. Being in the earth, the air, the water, in our food and drink, the existence of most of these germs is altogether salutary. They thrive for the most part upon dead organic matter, upon material such as has at one time or another been a part of some living object. And it is their business to render possible the conversion of oxygen, hydrogen, carbon, nitrogen, and other elements necessary to animal existence into visible vegetation and other food products upon which animal life may subsist. Each germ acts as a minute chemical laboratory, absorbing the organic matter upon which it feeds, and resolving it into new compounds, using a part of these for its own sustenance and reproduction, and giving off the rest into its environment.

But among the many varieties of these germs there are some—comparatively a very few—which have proved inimical to animal health. And these have been studied with special care. There are three subdivisions of them, according to their appearance under the microscope: First, the bacilli (a rod) are rod-shaped or perhaps slightly curved. (Fig. 9 B.) Such are responsible for tuberculosis, typhoid, cholera, and many other diseases, each causing its own particular disease, and having distinctive features by which it is distinguished from other germs. Second, there are the cocci (a berry), which are berry-

shaped, and which are of two sorts—the streptococci, which in multiplying assume the chain formation, and the staphylococci, the groups of which appear like bunches of grapes. (Fig. 9 A.) These cocci are generally affiliated with the bacillus of tuberculosis in the later stages of

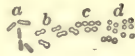


FIG. 8.—Germ multiplication.

the disease. Then there is a third form of bacteria, the spirillum, which is responsible for certain fevers. With this, however, we have here nothing whatever to do.

When a species of these bacteria gains lodgement in a vulnerable body, one suitable for its growth, the germ multiplies with inconceivable rapidity. This is the reason why germ diseases are infectious or communicable. Every case arises from a preceding case. The infection originates

in parasitic life, and is due to the propagation and dissemination of these parasites, which take from the nitrogenous tissues of their "hosts" material for their own nourishment and growth. In turn they evolve and set free subtle poisons (toxins). It is these toxins which cause the temperature, the rapid pulse, the chills, and the other symptoms constituting the infective process.

Let us emphasize here the vulnerability of the tissues. It is a matter of common observation that there are some who will contract an infection, while others living under the same conditions and circumstances will escape. The fact is that there are two elements which are essential to the development of an infectious disease. In the first place there is the presence of the specific cause, and in the second place there is the condition of the body—a tendency or a predisposition—which renders it fruitful soil for the development of the germ.

This tendency or susceptibility to tuberculosis is a relative, not an absolute term, and there are a number of modifying considerations. For instance, it may be inherent in individuals; or in races, as the negro. It may be natural, or acquired, or inherited. It is influenced by starvation, alcoholism, shock, sudden changes of temperature, fatigue, worry, or bad ventilation in dark rooms. Then, as regards the bacteria themselves, if their number is below a minimal amount, they are not effective; if the dose of them be maximal, one is the more easily affected. Then, again, the animal body has



FIG. 9.—Varieties of bacteria.

the power to produce certain substances, which are formed during exposure and which protect it against micro-organisms and their products or toxins and to neutralize these poisons. The nature of these substances is as yet vaguely known, but both the cells and fluids in the body are concerned in their evolvment. There are several theories upon which explanations of this protective action on the part of the tissues and juices are based. That of Metchnikoff, though by no means conclusive, is very interesting. He declares that there is a property inherent in the leucocytes (the white cells in the blood and the wandering cells in the tissues—under certain circumstances the “pus cells”), and in certain other elements, by which the invading organism is attacked and devoured. This is phagocytosis. A microscopic battle is assumed. The organism is safe if the phagocytes are able to devour the attacking germs. Disease results if the invaders are able to overcome the phagocytes. Of these contending forces, one is bound to succumb to the physiological demands of the other. The bacillus of Koch is a non-mobile organism. It cannot move by itself and must be carried around by other agencies. Thus can the leucocyte, by means of the amœboid properties which it undoubtedly possesses, the more readily devour and destroy the germ.

. This theory of the physician-philosopher seems fanciful and has an eerie interest, because of the sentient properties implied in the leucocyte. It will seem less fanciful if the behavior of the amœba, a unicellular organism, be studied in relation to the processes by which it maintains its existence.

I think this is a good place to get rid of the term contagion. This is applied vaguely to diseases contracted in indefinite ways, or by exhalations, etc. We speak, for instance, of diphtheria, measles, or scarlet fever, as contagious diseases. The practical point is this: One cannot be sure, after having been half an hour in the same room with a diphtheria patient, that he will not contract this disease. On the other hand the infection of tuberculosis is disseminated through the medium of air-borne droplets of sputum, or particles of bacillus-laden dust, and in bacillus-carrying food and drink. The mere breath of the sufferer does not convey the infection, the manner of which is thoroughly well understood. We shall find that one may live with a consumptive for months or years without jeopardizing his health, by observing certain definite and very simple directions which science has formulated. The term infection is all-comprehending. It implies mediate or intermediate, direct or indirect contact, and it does not convey the vague and false sense of terror implied in the idea of a contagious disease. Let us drop the latter term.

CHAPTER II

THE GERM OF TUBERCULOSIS

The kaleidoscopic phenomena of this earth as we see them around us are the result of a continuous alternation of life and death. In this beautiful panorama death is as necessary as life. Something is always dying that something else may live. Inorganic matter continuously is being changed into organic matter and organic into inorganic. For changing organic matter into inorganic matter God has created the micro-organic world.

A micro-organism which, perhaps, has slipped away from its natural place in organic nature, and in consequence has done much damage to man, is the tubercle bacillus.—Flick.

IN 1881 Dr. Robert Koch, of Berlin, discovered the bacillus which is the specific cause of tuberculosis, and his investigations were conducted in conformity with the following rigid requirements, which he himself formulated :

1.—The micro-organisms must be found invariably in a given disease and in no other, their numbers and distribution conforming to the lesions of the disease.

2.—The micro-organisms obtained from lesions of the disease must be capable of reproduction in pure cultures.

3.—These cultivated germs must be capable of producing the disease if inoculated on a susceptible animal.

4.—These artificial lesions contain the specific organisms.

This bacillus is a fungus, of the class of vegetable micro-organisms, and is a slender, straight, or slightly curved rod-shaped body, in length about 1/10,000 of an inch. The biologist considers it to have become in the process of evolution an "obligate" parasite, one of the class of germs which can subsist only upon the living animal host. But it is probable that originally this bacillus was a "saprophyte," when dead organic matter was its natural habitat, and that, as Dr. Flick has observed, it has somehow slipped away from its proper place in nature. This is a notable, though a very grewsome point, and one fit to be touched upon by Robert Louis Stevenson in one of his most uncanny moods,—that next to dead organic matter, the bacillus thrives best upon tissues which are made non-resistant hosts by reason of the demoralizing effects of poverty, alcoholism, vicious heredity, and like factors. Even excessive cold will not kill it. It may live for many months—for years—in dark, foul, and damp places. Boiling, heat,

and certain disinfectants destroy it. It seems, however, to have got so acclimated to its parasitic existence that it now rarely multiplies outside the animal body except under laboratory conditions. At the bodily temperature it develops in such substances as glycerinated beef tea,—but slowly, requiring from two to three weeks for any considerable growth. It will not flourish in other temperatures than between 90° to 100° F. Under favorable circumstances of multiplication a mass of these bacilli accumulates—a colony—which may be appreciated by the naked eye.

CHAPTER III

THE KOCH BACILLUS AND THE TUBERCLE

There is every reason to believe that, though tubercle bacilli may live for certain lengths of time outside of the animal body and may be cultivated on specially prepared media, they flourish only in the living body, and that if dissemination of the bacilli from diseased animals and human beings could be prevented the malady could be arrested.—*Maryland Tuberculosis Commission.*

WHEN the Koch bacillus becomes implanted in any part of the body, it causes an inflammation with the result that there is a rapid multiplication of the tissue cells of that region. These abnormal elements gradually increase in bulk until a tubercle is formed, a structure



FIG. 10.—The lungs. (Courtesy of T. H. McAllister.)

at first microscopic in size, becoming when visible of grayish or pearly appearance. These tubercles may exist in any part of the body, in the skin, the lymph glands, the liver, the spleen, the kidneys, and especially in children in the bones and joints, and the membranes covering the brain. It will suffice to describe those in the lungs, where they are most abundant; here their appearance is typical.

The healthy lungs are fairly well represented in Fig. 10. The trachea subdivides into the right and left bronchus, which ramify into their respective lungs. The minute subdivisions of these bronchi are the bronchioles, the terminations of which are into air vesicles.

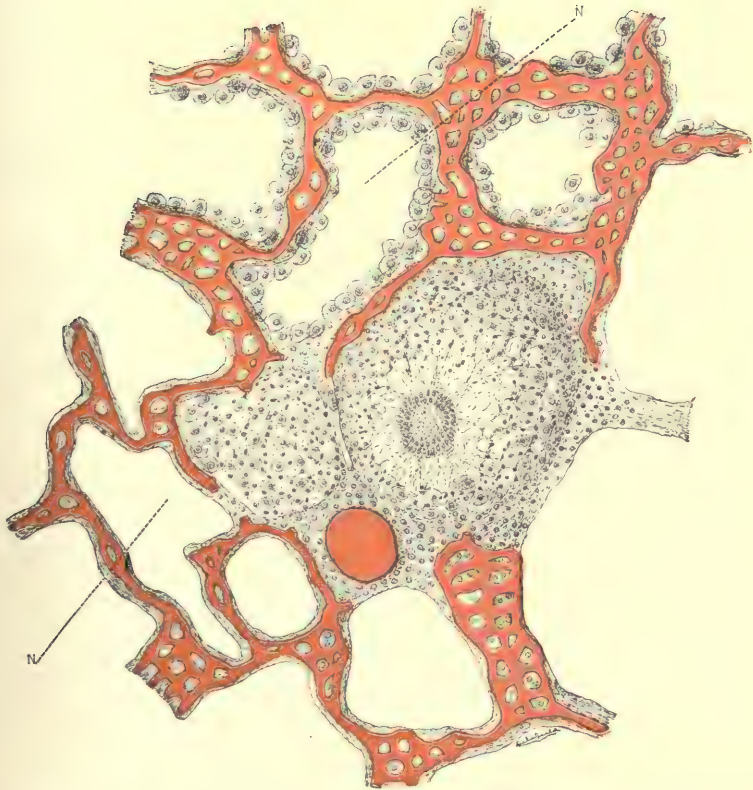


FIG. 11.—A miliary tubercle $\times 300$ and reduced. Involving two air-vesicles, of which the walls are infiltrated and the cavities filled with tubercle tissue. The blood-vessels of the air-vesicles are injected. (Delafield and Prudden.)

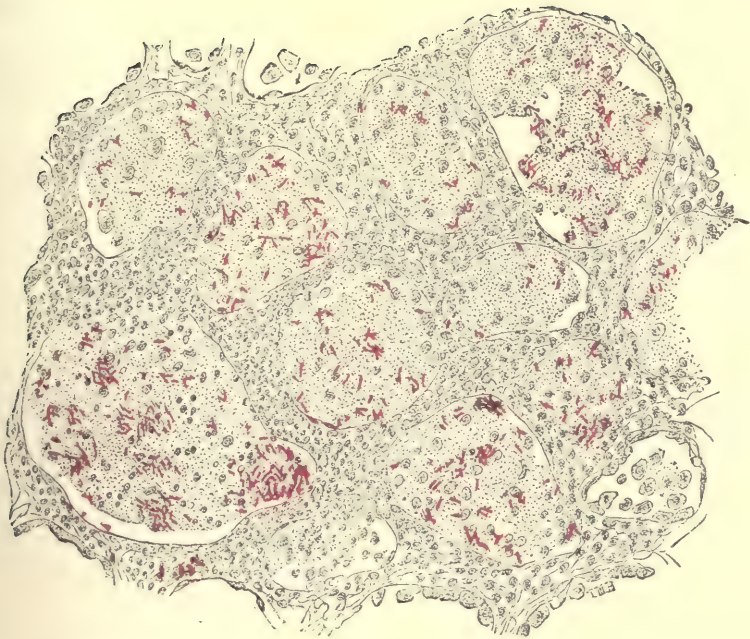


FIG. 12.—Miliary tubercle in lung of child, showing the *Bacillus tuberculosis*—stained with fuchsin—in the contents of the air-vesicles and in their thickened walls. (DeLafield and Prudden.)

Around the latter are capillary networks through which the venous blood is conveyed from the heart, to render up its carbonic acid and other waste substances into the air vesicles to be exhaled. On inspiration, the life-sustaining gas is taken into the air vesicles, from which it is absorbed by the blood contained in the capillaries which return to the heart, whence it is pumped through the arteries to the remotest tissues of the body. In Fig. 11 the spaces marked "N" are normal vesicles. But in two vesicles tubercles have formed, so that in these at least the normal function is destroyed. In Fig. 12, from a child's lung, we see the bacilli in the substance of the tubercles. In this product of disease there is no blood supply in the normal sense; wherefore, and because of the irritation due to the presence of the bacillus and its toxins, one of several things results. Generally there is local death of tissue, resulting in "cheesy" degeneration and liquefaction. Several

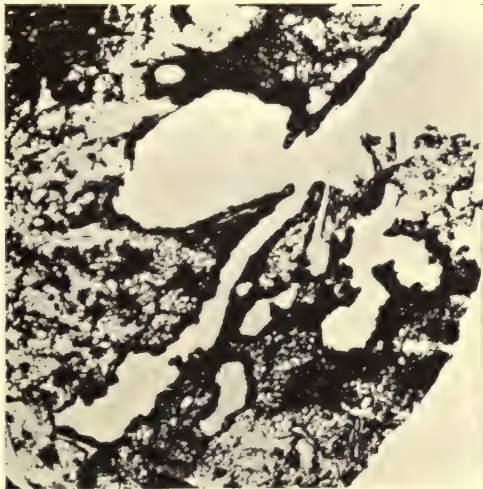


FIG. 13.—Cavities in lung tissue.

adjacent tubercles may break down together; and then the purulent material, teeming with millions of bacilli, will be coughed up through a bronchus as the sputum of the consumptive. Thus does a cavity result. These are sometimes found upon autopsy to be so enormous that one is amazed how the patient could have lived at all with so much of the lung destroyed. Then an artery or a vein may be eroded during the tubercular process, so that hemorrhage from the lungs may occur. In such manner also may the products of tubercular disintegration be carried by the lymph and blood channels to other parts; and it is probable that in many cases the pulmonary type of

tuberculosis is not a lesion of the lung tissue, but a product transferred from a point of implantation elsewhere.

If much broken down tubercular material should gain access directly to the circulation, the blood stream may carry the infection to many vital tissues, and "miliary tuberculosis" will result; this is a very dreadful form of the disease in which there is rapid infection,

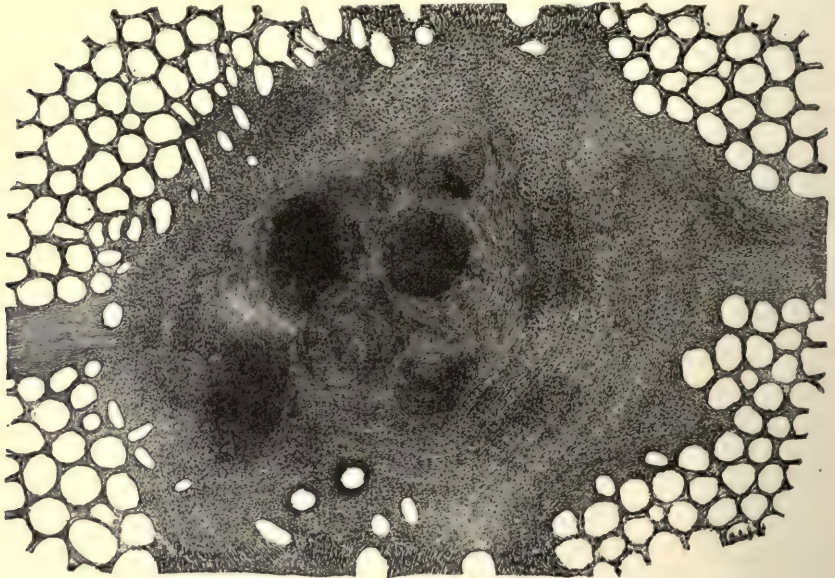


FIG. 14.—An old miliary tubercle converted into fibrous tissue. $\times 90$ and reduced.
(Delafield and Prudden.)

with very pronounced and fatal symptoms. However, other and more favorable processes are likely. The connective tissue cells are often able to build a dense wall about the affected region, shutting it off from normal parts. Or a fibrosis results (Fig. 14) akin to the scar which follows a cut wound of the skin. This is a process of healing which obtains when the patient gets well of his consumption. Or there is a deposition of innocuous lime salts, taking the place of tissue previously tubercular.

The advanced consumptive, in coughing, emits several billions of these bacilli in twenty-four hours. It would seem then that this germ is all-pervasive. There have, indeed, been calculations made which would seem to substantiate this gloomy view, and which would warrant the pessimist in the opinion that nobody can escape tuberculosis. However, this germ is in reality not ubiquitous. Besides, outdoors, where there is fresh air and sunlight and pure water, the bacillus

has little chance of life. It is only in houses (enclosures of all sorts) that are dark and damp and ill-ventilated that tuberculous infection is to be feared. Besides, as we have seen, even though the bacilli enter the tissues of the healthy body, there are forces within the organism which are continually at work destroying these germs and nullifying their pernicious activity.

Besides the means of protection stated there are the following :

The nasal air passages are tortuous and lined with a moist mucous membrane, against which the inhaled air impinges. Thus are dust and many germs held fast, and perhaps expelled in blowing the nose. (Mouth-breathers do not enjoy this safeguard.) Many bacilli are hawked and spat out. Then there are in the air passages, down to the bronchioles, delicate membranes made up of cells, the free borders

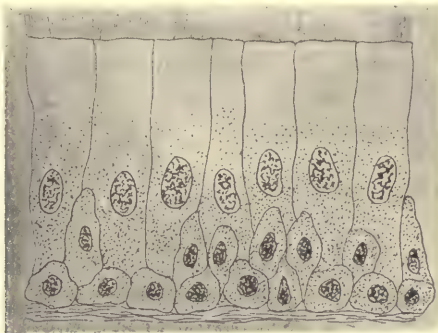


FIG. 15.—Cells with cilia upon their free borders.

of which have hairlike projections; these “cilia” work continually with a forward motion, so as gradually to expel germs and other deleterious objects.

Then certain juices of the body, and the lymph vessels and glands, are very important factors in the destruction of the bacillus. The vessels drain the lymph from the affected areas; and the glands arrest the invasion and act, in so far as they are able, as a barrier to the progress of the disease; their own structure, may be, being finally broken down and destroyed in the struggle.

We find, then, that the bacillus of Koch is the specific cause of tuberculosis; this disease does not exist in the absence of this germ. However, the entity tuberculosis is, as we shall see, the resultant of many factors; and we will be quite accurate in saying that the tubercle bacillus is really an index of the complex of symptoms which we call tuberculosis. There are indeed other germs which act in conjunction with the Koch bacillus, their pernicious activity being generally subse-

quent to its own, and these allied micro-organisms—the cocci—are always present whenever the disease has assumed a serious aspect.

Two or three terms may here be defined :

Phthisis means the same as consumption,—a consuming or a wasting away. One term is Greek, the other from the Latin.

There is a distinction between the terms “tuberculosis” and “consumption.” As we have observed, very few of us die without some evidence of the activity of the tubercle bacillus ; however, in most of us the presence of tubercles is not evidenced ; but when the characteristic symptoms of the disease in the lungs are manifested, the term consumption is employed. However, I shall not in this book adhere to this distinction.

CHAPTER IV

AVENUES OF INFECTION

Every person is exposed to the danger of taking up the germs of tuberculosis into his own system, and many harbor them a long time without knowing it. Every one must therefore be prepared for battle with this enemy.—*Imperial Board of Health of Germany.*

THE bacillus is generally found in the sputum of the consumptive; the air which he exhales is not considered to contain it, and is therefore not infectious. But the consumptive's sputum, when emitted, is taken up in the dust of the atmosphere; or minute droplets of the



FIG. 16.—Consumptive father with infant as yet unaffected.

infected sputum may be conveyed by the wind. Then, if this dust or spray is breathed by susceptible people, they will be in danger of contracting tuberculosis. It is such transfer of this parasitic organism, from one body to another, which makes consumption a communicable disease.

And the sputum may be infectious in other sometimes very loathsome ways than by inhalation. Infants may become infected by picking up on the floor, while they are playing, objects upon which sputum may have been deposited, and, after the fashion of infants, they will put these objects into their mouths. The suckling may con-

tract the disease by contact from its consumptive mother. The hands of the consumptive, his lips, his moustache, his beard, his napkin or handkerchief, may be bacillus-laden; and his kisses may transmit the infection.

Besides being inhaled, the bacillus may, not so frequently, be ingested with the meat of tuberculous cattle, or the milk of tuberculous cows; for other animals than the human species suffer also from tuberculosis. There has of late been some question of the likelihood of the transmission of bovine tuberculosis to man. Koch has denied this; on the other hand very many careful scientific workers emphasize the danger of such transmission. We will presently review briefly the situation, being content here to observe that if milk or other fluid is tainted, or if meat be diseased, nobody wants to eat or drink either of them, irrespective of any consideration that may be inferred; nor should anybody want that his neighbor should have such things to eat and drink.

A third and comparatively rare mode of infection is through wounds. Oftentimes there will be a tuberculous nodule at the seat of the injury. And in many cases the infection does not proceed beyond this nodule; so that merely a local tuberculosis will result.

All solutions of continuity of the skin and mucous membranes, either accidental or surgical, may facilitate the entrance of the bacillus, —as poisons of the skin and mucous membranes, bites, scratches, penetrative wounds at autopsies, such as physicians may inflict upon themselves, insect bites, tattoo marks, abrasions from pointed prominences of teeth or from extractions of teeth, burns, wounds of the navel, slight injuries due to digging in the nose with the finger or puncturing the ears for rings, irritation from contact of different parts, injury of the eye. Blows may, moreover, act by contrecoup; for instance, on a cheesy bronchial gland or on a tuberculous focus of the lung, so that an infection may be engendered, if the bacillus be thus made to enter the circulation.

Bacilli have been found in the abdominal cavity and fæces of flies, which had sucked at the sputum cloths of consumptives. Thus these insects may be carriers of infection. Their activity, however, is limited to a few months in a year, and the amount of the dejecta in comparison to a single expectoration is minimal, and not important.

Reinfection is always possible. An implantation may have taken place at a time when the individual organism has been below par as the result of some predisposition. Perhaps the reinvigorated system has destroyed this implantation. However, there may be recurring implantations with recurring infections.

CHAPTER V

HUMAN AND BOVINE TUBERCULOSIS

The chief difference between them (the human and bovine bacillus) is their virulence. The bovine tubercle bacillus has a pathogenic power tremendously in excess of that shown by the human bacillus, and this holds true for all experimental animals which have been tried, with the exception, perhaps, of guinea-pigs and swine. These two animals are so susceptible to both types of the bacillus that it is hard to draw a distinction. The animals experimented on include horses, donkeys, sheep, goats, dogs, cats, rabbits, guinea-pigs and monkeys. There is absolutely no case in literature, so far as I am aware, in which one single animal has been found to be more susceptible to the human tubercle bacillus than to the bovine. This greater virulence of the bovine tubercle bacillus is shown by whatever method of inoculation we use.—RAVENEL.

BEFORE 1901 the medical profession were in general accord (much more so than on most subjects) concerning the practical identity of human and bovine tuberculosis. In that year Koch stated, in an international congress in London, that according to his belief the human and bovine varieties were essentially different and not inter-communicable. This statement created no little surprise, in view of the large amount of scientific information that had been gathered up to that time, the gist of which was to demonstrate tuberculosis infection by means of the meat and milk of tuberculous cattle. However, in the light of this opinion, by so great a man and so earnest a worker, it was very desirable that further investigations should be made. And since this memorable meeting much further work has been done upon this subject in America and in Europe, both privately and under official auspices. A royal commission was at once appointed in England. Its findings, but lately published, are quite averse to Koch's views.

If equally competent workers get differing results from their tasks, it might be hard to say why one set of experiments failed and why another succeeded. However, negative testimony must always be less valuable than that which is positive. To discover experimentally if human tuberculosis is transmissible to cattle is easy, though unfortunate for the cattle; this result has been obtained in so many instances that there is no room for doubt in the candid mind. As an odd instance of how such infection may come about indirectly Dr. Darlington, the New York City Health Commissioner, states that in a hospital to which he was visiting physician, consumptives were allowed

to play quoits in a pasture near the hospital. At this time they did not use their spit-cups and spat upon the grass. Ten cows grazing in the same pasture were killed, and it was found that nine of them had general tuberculosis. On the other hand, deliberately to inoculate human beings for experimental purposes is not feasible, to say the least. However, it has been done, both by accident and intentionally. If disease has positively been transmitted by feeding or inoculation in only a limited number of cases, the fact certainly indicates an alarming possibility. Part of Koch's error lay in that in his researches he looked in the wrong place for effects. He fed tuberculous human sputum to undoubtedly healthy calves. And when he killed them a few months later he examined their intestinal canals. He could find no signs of disease there, and so inferred the animals had not been infected. Other observers repeated these same tests and did find results of infection by looking for them in other places besides the intestines. Dr. Sidney Martin, of the Commission, found such results; as did also Ravenel, of Philadelphia, whose investigations are scientific and important in the last degree. Ravenel fed bacillus-laden butter to healthy animals, and having killed them shortly after their meal, found bacilli in the products of digestion in the thoracic duct, although the intestinal tract showed no evidence of tubercular infection. Indeed, many experiments have shown that the tubercle bacillus may penetrate the healthy mucous membrane and not leave any indication of its passage. It has become established that the course of ingestive infection is oftentimes through the lacteals (the lymphatic vessels of the intestines), thence to the thoracic duct, and so to the great veins, to the right heart, and finally in the venous capillaries to the air vesicles. The commissioner found, moreover, that of twenty strains of human origin, seven gave rise at once in cattle to acute tuberculosis with widespread infection of lungs, spleen, liver, lymphatic glands, etc. In some instances the disease was of remarkable severity. The other strains, with two exceptions, produced a more or less localized lymphatic infection, with at most a very small amount of tubercle in the lungs and spleen. Tuberculous material, however, taken from the bovine animals thus affected, and introduced successively into other bovine animals, or into guinea pigs, from which bovines were subsequently inoculated, has, in the case of five of these strains, ultimately given rise to general tuberculosis of an intense character. In the case of two strains the disease produced by the inoculation was limited to the spot into which the material was introduced. This occurred in two instances only at the very beginning of the inquiry. The disease thus set up in the bovine animal by

material of human origin was compared with that set up in the bovine animal by material of bovine origin; and the one, both in the broad general features, and in its finer histological details, was identical with the other. The Commission failed to discover any character by which the one could be distinguished from the other, and states that its records contain accounts of the necropsies of bovine animals infected with tuberculous material of human origin which might be used as typical descriptions of ordinary bovine tuberculosis.

Again, Koch assumed that bovine tuberculosis could not be transmitted because he found that there are among children an exceedingly small proportion of cases of intestinal tuberculosis. Besides the contradictory considerations here advanced, the possibility of latency in this disease is worthy of note. It is certain that milk may occasion tuberculosis among human consumers. The conclusions of the Commission and of many individual experts are here exceedingly important. The Commission found that from twenty-five to thirty per cent. of the milch cows in England were tuberculous. Even in private herds, under as perfect care as is possible, does this disease exist; in one instance, one-half in a herd of sixteen, the lesions being evident in the slaughtered animals.

The *Lancet*, then, observes quite rightly that the conclusions of the Commission should prevent "the framing or modifying of legislative measures in accordance with the view that human and bovine tubercle bacilli are specifically different from each other, and a wholly different thing from the disease caused by the other."

And we must conclude that the great German is mistaken in the position here indicated.¹

¹ The papers of Ravenel and Salmon are very informing upon this subject; they give the names of more than fifty workers in the field of animal tuberculosis.

CHAPTER VI

LATENCY

There is always some levelling circumstance that puts down the overbearing, the strong, the rich, the fortunate, substantially on the same ground with all others.—EMERSON.

THERE is oftentimes a period of latency in tuberculosis. Exactly how this comes about is not well settled. There is the view that the bacilli, after having become located in a tissue, remain inert in the body for a time; toxins may have been evolved, but not in sufficient amount to produce symptoms. This condition has been demonstrated in the febrine, a silk-worm disease. Here the pathogenic bacteria can actually be seen in the egg; but they are quiescent during the germ stage, and do not develop until the growth of the caterpillar begins.

Deaths from consumption are, with relation to other periods in life, infrequent before the fifteenth year, and the symptoms of the disease, moreover, are manifested with comparative rarity before then. Pulmonary tuberculosis is rare before adolescence. But from the fifteenth to the forty-fifth year every third or fourth adult dies of consumption, generally of the lungs. When we consider that infants and children are certainly as much, probably more, exposed than adults to tuberculous infection, we must infer that there has in many cases been a period of latency during which the infection has lain dormant through the earlier years of life, until active infection has been induced by the advent of some acute exciting cause.

The student has found such latency to be even more marked in other infectious diseases, such as syphilis, with which, for purposes of observation, tuberculosis may be compared. Of course, these are two distinct morbid entities. Children, who have been impregnated with syphilis, may appear normal in infancy and childhood, and may not manifest this latent specific infection until the fifteenth or twentieth year. In the play, "Ghosts," the symptomatology of cerebral syphilis in a young man, in whose previous life no manifestations of the disease had appeared, is set forth in a most grewsome manner. It may seem poor science to cite for an example a character portrayed by a dramatist for the stage. However, it is said that Ibsen got his basic facts from a physician profoundly learned in syphilology; and no

medical man will question the ghastly reality of the picture. Tuberculosis differs essentially from syphilis in that in the vast majority of cases it is not the disease itself but a tendency to it which is transmitted by the parents. This vulnerability is exhibited in the serofulous temperament with which such children are born. Upon such tissues the bacillus engrafts itself with peculiar ease in infancy and childhood. Even in children born healthy, however, there is no difficulty about the reception of the Koch bacillus in the organism, and the analogy with syphilis seems from this point complete,—that the tubercle bacillus may remain inactive for years in some perhaps remote portion of the organism, such as a lymphatic gland, the bone-marrow, or a joint, until a blow, the shock of an operation, an aberration of adolescence, an acute fever, or some other exciting cause, may provoke it to pernicious activity.

CHAPTER VII

IMMUNITY

When an organism, subjected to the action of some influence noxious to certain other organisms, is found to be insusceptible to it, that organism is said to be immune from that particular noxa.—BARKER.

I HAVE stated that one may inherit a tendency to tuberculosis from one's parents. Nevertheless, it actually happens sometimes that one receives from his tuberculous parents an immunity to tuberculosis. For instance, a father died at thirty-six of consumption, leaving six children, all of whom are now living, and the youngest of whom is even older than the father was at the time of his death. There has never been any manifestation of tuberculosis in any of these six children, except to a slight degree in the youngest. Of the four sisters, all of whom are excellent specimens of normal, vigorous womanhood, three have large families of very healthy children,—one, the wife of a Methodist clergyman, having the largest and an altogether stout offspring. Of the two strong brothers, the elder, a man of forty-seven, has been under the imputation of using false teeth and of wearing a luxuriant coal-black wig from which gray hairs have been carefully excluded, so serviceable and hardy do these members continue; and their virility are an index of that of his frame generally. And this is the more remarkable since this elder brother is a poet and a Bohemian, who sedulously disobeys every hygienic canon that was ever invented with the unctuous abandon of a college freshman.

Not a few cases akin to this, exemplifying the transmission of an immunity, are to be found in medical literature.¹

With regard to immunity, tuberculosis is akin to other infectious diseases, and the matter will be better understood by a consideration of the general subject. One is said to be immune when he is not susceptible to the action of bacteria and their toxins, such as affects his fellows. Inherited immunity has been found experimentally in anthrax and tetanus; here the offspring enjoy a "natural" immunity handed down by either parent. This natural or innate immunity obtains in species and races, with wide differences, however. Mankind is susceptible to many infectious diseases, such as typhoid fever, and, markedly, syphilis; these, in the ordinary course of nature, never occur

¹ Flick, King.

in other creatures. Different races of men vary much in their susceptibilities. The negro is very prone to leprosy and tuberculosis, but is practically immune to malaria or yellow fever. Then there are many infectious diseases which yield immunity by a single attack. Scarlet fever, measles, and typhoid are seldom contracted more than once. With age the frequency of infectious diseases diminishes. The reason for this probably is that the immunity of old age depends in great measure upon previous maladies and vaccinations. Indeed, it would seem that each infectious disease evolves its own antitoxin or antidote to its own poison, just as the antitoxin which protects against diphtheria is derived from the germs which cause that disease. How otherwise, indeed, would it be possible to recover from any infection that has once established itself when germs multiply so rapidly? If this is the case, it is easy to understand how parents may in this manner protect their offspring.

There are then several explanations possible of immunity, both hereditary and postnatal. The germs do not proliferate in the body, because they do not find the conditions essential for their growth; or the conditions may be favorable and yet substances may exist or be formed in cells and fluids of the body which destroy the germs; or the tissues may become less vulnerable by adaptation to the baneful effects of the germs and their toxins. We shall amplify this subject.¹

¹ Part VI., Chapter VIII.

Part III

PREDISPOSITIONS TO TUBERCULOSIS

In all tubercles two processes go on: the one—caseation—destructive and dangerous; and the other—sclerosis—conservative and healing. The ultimate result in a given case depends upon the capabilities of the body to restrict and limit the growth of the bacilli. There are tissue-soils in which the bacilli are, in all probability, killed at once,—*the seed has fallen by the way-side*. There are others in which a lodgement is gained and more or less damage done, but finally the day is with the conservative, protecting forces,—*the seed has fallen upon stony ground*. There are tissue-soils in which the bacilli grow luxuriantly; caseation and softening, not limitation and sclerosis, prevail, and the day is with the invaders,—*the seed has fallen upon good ground*.

OSLER

CHAPTER I

PRELIMINARY

Death has not only particular stars in heaven, but malevolent places on earth, which single out our infirmities, and strike at our weaker parts.—SIR THOMAS BROWNE.

PREDISPOSITIONS to tuberculosis may be either hereditary, or such as prove pernicious in the period between conception and birth; or they may be postnatal.

It is pertinent to the trend of this subject to repeat the much-quoted statement that life is the continuous adjustment of internal relations to external relations. This very inadequate definition nevertheless emphasizes the position in which the organism is placed with regard to its environment. And it is in this broad aspect that I am about to consider the effects of external phenomena upon the economy with reference to consumption.

And I shall not be content to examine only into such predispositions as may obtain in the time between birth and old age. I shall recognize the tremendous importance of prenatal influence. Indeed, the divisions of this subject which I have made are purely arbitrary; for at conception, as we have seen, older cellular elements are but transmuted into a new cellular combination; nor is birth more than another step in a series of life processes.

It is not merely a fancy of the romancer, but a statement saturated with practical sense, that the past lies upon the present like a dead giant's body, so that it is as if a young giant were compelled to waste all his strength in carrying about the corpse of an old, an atavistic giant. We sleep in dead men's houses, bacillus-ridden as they are; we are sick of dead men's diseases; we live in dead men's lives; in like manner as these sentiments are taken from a dead man's book.¹ And it is equally true that future generations must inevitably be affected by the disposition, physical or otherwise, of the lives of individuals in the present.

¹The House of the Seven Gables.

CHAPTER II

HEREDITARY INFLUENCES

The influences by which scrofula has become a permanent element in human society have probably affected several generations in succession.—DUCKWORTH.

WITH regard to heredity in general it would seem that one may assume almost any position and will be able to set forth many unquestionable facts in support of the stand he takes. In considering the heredity of tuberculosis we come upon a wide range of positions, from that of the transmission of the disease itself, to the fact that tuberculous parents actually confer upon their offspring an immunity to the disease.

Since the demonstration of the Koch bacillus, and up to very recently, it has been generally agreed that only a tendency to the disease, a vulnerability, and not the disease itself, a soil predisposing the organism to tuberculosis, may be transmitted.

There are certain signs by which this hereditary tendency to tuberculosis may be manifested. Chief among these is what I venture for the present to call the scrofulous temperament. The scrofulous child has a pallid skin and flabby flesh; there is often chronic blepharitis; phlyctenulæ are frequent; the nose is large and broad and acnestudded; there are nasopharyngeal adenoids and hypertrophied tonsils, so that these children are mouth-breathers, starved for oxygen. There are tedious inflammations of the mucous membranes,—coryza, congested and unhealthy throats, and bronchitis exceedingly rebellious to treatment; there are persistent adenitis and periadenitis, the lymphatic glands becoming enlarged and remaining so. There is a sluggish, torpid metabolism. Altogether there is evidence of a radical nutritive disturbance.

Besides struma, we find thoracic malformations, narrow chests, lacking also in depth, projecting shoulder-blades, and small respiratory muscles. There are emphysema and an evident capacity for breathing below the average. There is, again, defective development of the circulatory system, especially of the aorta; there are congenital heart-lesions, and the heart is small. There are anæmia and chlorosis. Among other manifestations are slow teething and deficient ossification in children, infantilism, stunted growth, and defective genital development.

It is evident that among these signs of hereditary transmission some are of an anatomical sort, while others are functional in character. This is an important distinction from the view-point of practical therapeutics. For it is a well defined law of heredity that functional rather than anatomical modifications are transmitted; at any rate the latter are consequent upon the former, the development of any organ being regulated by exercise of that organ.

Functional modifications may indeed be unaccompanied by anatomical stigmata; the former may be exaggerated through successive generations without giving a hint of their existence, until the stimulation of some exciting cause, as a traumatism or an intoxication, may bring them to light. Thus it is that many having seemingly vigorous frames nevertheless succumb to the onset of the tubercle bacillus and its allied micro-organisms.

This fact should appeal to those who would claim, from an absence of demonstrable anatomical lesions, that there is no such thing as hereditary transmission. Tuberculous parents may not bequeath definite stigmata; nevertheless they often do impart a pernicious nutritive habit to their offspring. For instance, the latter may suffer because of insufficient respiratory activity. This would certainly occasion deficient oxygenation, so that there would result a lessened vigor of cell-regeneration and of connective-tissue formation, an imperfect metabolism, and the like,—a condition of things pathological enough, yet in its incipency at least non-microbic; a condition non-infectious, but cordially inviting infection.

—Moreover, in examining these indications of a transmitted vulnerability to tuberculosis it is worthy of note that many of them are distinctive also of other affections in which heredity plays a part, such as insanity, alcoholism and syphilis. Insanity and alcoholism, non-microbic affections, are often correlated with tuberculosis; and there are not a few analogous features between the latter and syphilis. The conclusion then would seem warranted that in all such affections, tuberculosis as well as the others, there is a like degenerated condition of the organs and tissues, which makes them fruitful soil for microbic germination.

Is tuberculosis a "family" disease? In many instances it is so—so often that the fact is unquestionable. Generation after generation the disease manifests itself in given families, so that sometimes no member escapes. This, again, is not a transmission of the disease itself, but of vulnerable tissues.

CHAPTER III

PRENATAL INFLUENCES

The gods always throw the dice impartially.—SOPHOCLES.

WHEN we come to consider the period between conception and birth we find that specific congenital infection by the Koch bacillus undoubtedly exists. Tubercles containing the bacillus have repeatedly been found in the still-born. The bacillus has been found in the tissues concerned in reproduction in both sexes; the bacillus and its toxins have been found in the semen of infected animals. And a conclusive analogy may be adduced from undoubted congenital infection in syphilis, smallpox, glanders, cholera, and pneumonia.

Still, these infections are comparatively rare. What is probably much more frequent is a susceptibility to infection in the tissues of the embryo and fœtus. Here the parental condition at the time of conception is an important consideration. Roger cites a case of parents, of uncommon strength, who had three children. The first-born and the youngest were very well constituted and had inherited the strength of their parents; the second, conceived at the time when his father was convalescent from pneumonia, was poorly developed, remained feeble, and at the age of twelve contracted tuberculosis, from which he died. Similar cases will occur to every practitioner. Bodily or psychic disorders in the parents, affecting either or both, must be considered. Such are: fatigue; convalescence after a serious illness; advanced age of the father at the time of conception; unfavorable age for procreation, a parent being either too young or too old; great disparity between the ages of the parents, more especially if the wife be older than the husband; relative lack of vigor in the husband compared with that of the wife; too rapid procreation—baneful both for parent and for offspring; physiological poverty toward the end of sexual life; concomitant diseases and conditions, such as the neuroses, syphilis, cancer, or privation; exhaustion or depression affecting the mother during pregnancy; consanguinity—baneful both in itself and as increasing the potency of other factors; causes accidental, or perhaps so slight as to escape notice, or which may be merely transitional in the parents. All such causes may induce a vicious nutrition, making the organism of the progeny receptive to infection, tubercular or otherwise.

During the embryonic period the cells become differentiated and the organs of the body are formed; during fetal life the organs thus formed increase in size and begin to take on their several functions. Throughout both these periods, but especially the former, the organism is most acutely sensitive to environmental impressions—to variations in oxygen supply, warmth, the chemical constitution of the maternal blood, uterine or placental diseases, and the like. When such influences are abnormal, it cannot be hoped that the tissues of the foetus will remain unaffected.

We may note, then, in a review of antenatal conditions, that fresh parental blood, and all that it connotes, will surely beget healthy offspring, having tissues resistant to pathogenic agencies. Impure blood, and its associations in the parents, will result in degenerated tissues in the offspring. This is as true for other diseases in which a vicious nutrition is transmitted—syphilis, alcoholism, epilepsy, asthma, insanity, and cancer—as for tuberculosis; there is then no reason why the influence of heredity in the latter disease should be ignored.

CHAPTER IV

INTRINSIC POSTNATAL FACTORS

To wilful men
The injuries that they themselves procure
Must be their schoolmaster.

SHAKESPEARE.

IN coming to a consideration of postnatal predispositions, I revert to certain aspects of struma, the pronounced sluggish metabolism, and the tendency to inflammation of mucous membranes and of lymph glands, the respiratory membranes and the glands of the mesentery being marked sufferers.¹

Many observers tell us that tuberculosis is, to begin with, a purely local affection. Generally it is quite impossible to discover the original point of invasion, or of implantation of the bacillus. Tissues which have had their circulation disturbed by traumatism, vasomotor, functional, and other disorders, become foci. The extension of the process then depends largely upon the spread of the bacillus from these diseased foci by means of the lymphatics and the blood-vessels.

The idea that pulmonary tuberculosis generally comes about in the first instance through the inhalation of the Koch bacillus into the air-vesicles is considered erroneous. It is held that the bacillus cannot be inhaled because the function of the respiratory tract anatomically and physiologically is limited to the admission of gaseous substances only; that air is changed in the alveoli, not by currents but by the subtler influence of the law of the diffusion of gases. The main routes by which the lung tissues are invaded are, then, two: by way of the bronchial glands to the thoracic duct, the right lymphatic duct, the right heart, and finally the lung; and by way of the alimentary canal, the course being the stomach, intestines, lacteals, thoracic duct, the vena cava, the right heart, and the lung.

The pathologist has, in fact, found very little evidence of primary invasion by the Koch bacillus of the pulmonary parenchyma, the cellular elements upon which its functions depend. There is abundant evidence of primary tuberculosis in the bronchial glands; but these are not, strictly speaking, parts of the lung parenchyma. However, in

¹ The layman had best fortify himself for this chapter by reading the letter in Part VI., Chapter IV.

almost every part of the body, differing in each individual according to his most vulnerable tissue, there is possible a primary tuberculosis; in the lymphatics, serous and mucous membranes, skin, periosteum, in the intra-abdominal, intracranial, and reproductive organs, in the nose, throat, ear, tonsils, mastoid, and the eye. The place of deposit is not necessarily the point of entry of the parasite. There may be tissues which for many years have latently harbored colonies of bacilli, without setting up symptoms until the advent of some acute cause.

But how explain, then, the frequency of pulmonary tuberculosis, particularly in the apices? The first rib is frequently immovable, so that expansion is restricted. Schmorl has found a furrow running around the upper aspect of the apex, which he attributes to defective development of the first rib. He finds that the bronchial twigs which supply the neighboring parts of the lungs are crooked, narrowed, or otherwise deformed, so as to present a favorable situation for the persistence of catarrh in the mucous membrane. Then Esser points out that in children at least the inflamed bronchial glands often compress the bronchi and also the branches of the pulmonary artery, which supply the upper part of the lung. So that in the apical region there are lessened power of expansion, imperfect aeration, and insufficient blood-supply. The pathology of "taking cold" is suggestive here; for tuberculosis frequently follows that condition. Cold will produce contraction of peripheral vessels, with pulmonary anæmia, the blood being in most cases driven into the abdominal viscera. And anæmic tissues present diminished resistance to infection, particularly when the Koch bacillus is the agent. Again, the venous blood, bacillus-laden, from the thoracic duct, is first carried through the pulmonary circulation for oxidation before returning to the left heart. The lungs, therefore, bear the brunt of exposure to this infection, and act as a strainer to the general circulation.

The alimentary tract is concerned in the spread of tuberculosis. It is to be emphasized here that in infants abdominal tuberculosis is more frequent than the pulmonary form; it is striking also that gastrointestinal diseases are very prevalent in infancy and childhood, and that there is at this time much improper, or unsuitable, or artificial feeding. Here we must recall that the mucous membranes of the infant and child are very delicate. The intestinal tract is particularly permeable; here, moreover, there is a very rich supply of blood-vessels and lymphatics.

The germ is often taken in with the food, or from bacillus-laden things such as infants are in the habit of putting into their mouths. Tuberculous excreta from the upper air-passages are swallowed. In

the stomach the germicidal properties of the gastric juice are encountered—an ineffectual safeguard, however. If digestion here is impaired or incomplete, the bacillus is passed intact into the intestines, where unassimilated material, including the bacillus, must occasion intestinal hyperæmia. Under these conditions peristalsis mixes the undigested bacilli with the chyle. Then the lacteals and the lymphatics take them up and carry them into the mesenteric glands and the thoracic duct. Those which reach the mesenteric glands are likely to colonize and be carried into the thoracic duct, whence they will reach the pulmonary circulation by way of the vena cava.

The tuberculosis of children is more common during the first year, when milk is the almost exclusive diet. The likelihood is that milk often contains tubercle bacilli which may pass through the delicate and tender intestinal mucosa. Bone tuberculosis is frequent in children. The bone abscesses—white swellings of the fingers, the feet, the hips and other joints, the spine (Pott's disease)—are of this nature and they sometimes occasion deformities, such as hunchback, which persist throughout life.

Von Behring is of the opinion that the principal danger of infection lies in the greater relative susceptibility of the infant, especially on account of the vulnerability of the digestive mucous membrane at that age. He considers the chief source of infection is to be sought in the food of infants, especially the milk which they consume—an extreme opinion, in conservative judgments. He believes that when an adult takes consumption there is simply a recrudescence of the tubercular process which originates in infancy.

The young often have tuberculosis of the peritoneum, manifested by abdominal pain, swelling, and dropsy. Then there is the meningeal form, in which the membranes covering the brain are involved—a truly dreadful condition. The tissues here attacked—bone, brain, lymph glands—are such as are in children undergoing physiological growth; and they are easily prone to “disease of an irritative, congestive, or inflammatory nature,” such as tuberculosis.

A faulty metabolism plays an enormous part in predisposing the tissues to tuberculosis. The presence in the body of nitrogenous matters in a decomposing or readily decomposable state affords an ideal pabulum for the nourishment and development of micro-organisms and their toxins; and such factors as unwholesome food, bad water, and foul air will further an excess of these effete matters in the tissues. Ordinarily such material is limited to the amount which is continually being excreted in the ordinary waste of the body; and if the excretory organs all combine in normal action, this is drawn off

from the blood-currents as fast as it is poured into them ; so that the stream is kept clean. But if such decomposing matter be introduced abnormally from without, as in habitual infractions of hygienic laws, such as many who contract tuberculosis are addicted to ; or if it be generated in abnormal quantities within the body ; or if the normal process of elimination be in any way obstructed—a rapid accumulation will take place, so that there will be provided a fruitful soil for the growth of the bacilli and their toxins ; more than this, there result ideal conditions for the development of mixed infections, in which the cocci join the bacilli, so that a curable disease often becomes transformed into a fatal one.

We have touched upon hereditary lesions of the heart and blood-vessels predisposing to tuberculosis. An impaired circulation means reduced oxidation, and consequently tissue starvation, particularly in the lungs ; for under these conditions the vast capillary system opposes the already weakened cardiac contractions ; and the pulmonary structures will not receive even their share of the deficient blood-supply. In this connection Sajous holds that such symptoms as pallor, muscular weakness, a thin, compressible pulse, an undeveloped or slightly dilated heart, anæmia, anorexia, coldness of the extremities and habitual hypothermia, point to adrenal insufficiency ; we may not agree with him as to the reason for these symptoms, but they do denote an ideal condition predisposing to infection.

Chlorosis, or green sickness, an affection frequently related to tuberculosis, is referred variously to lesions of the vascular system, to adolescent disturbances, and to digestive disturbances ; in each of these aspects is a relation logically established.

Tuberculosis is prone to follow upon other diseases, such as bronchitis, influenza, and neglected colds ; pleurisy is often a forerunner. Convalescents from the exanthemata, diphtheria, and typhoid, and the coexistence of such affections as syphilis, malaria, and diabetes, are powerful elements in the growth of tuberculosis. The Koch bacillus finds the sugar-containing tissues of the diabetic an unusually congenial host.

Other predisposing factors are overindulgences in eating and drinking ; sexual excesses ; exhausting labors, mental and physical ; the want of wholesome recreation, of heat, clothing, and shelter ; pernicious atmospheres ; poverty ; the effects of prolonged lactation in tired mothers and of too frequent pregnancies ; injuries ; dangerous trades. These and many like factors will be considered in other places.

CHAPTER V

ENVIRONMENT

Whatever amount of power an organism expends in any shape is the correlate and equivalent of a power that was taken into it from without.—HERBERT SPENCER.

It were impossible to set down even a mere enumeration of extrinsic predisposing factors. For we are told that living itself is but the body's response to environmental influences, either physical or chemical in character; and such influences as these are about as numerous as are external phenomena. Personally, I would reserve the opinion that the whole of life is by no means comprehended in this statement. Still it is valid, as denoting the innumerable agencies which may make the organism receptive to infection, tubercular or otherwise.

Among these external causes we note, first, mechanical violence—various forms of direct injury resulting in contusions, wounds, and lacerations—which greatly favors the development of tuberculosis. But this is not essential, for the bacillus may penetrate the unbroken skin and mucous membranes. It is very likely that these cases often result in tuberculosis by shock and other nervous reactions being excited. Such "surgical tuberculosis" may appear in bones and joints, the tendons of muscles, and in various other tissues and organs. Foot wounds may result in infection of the lymph glands in the region about the hip. Then inhalations of insoluble, gritty particles induce in workmen a true tuberculosis. Continued pressure upon any part of the body may cause wasting or local death of tissue, making it receptive to microbic invasion; and this condition may lead to general toxic changes which would facilitate the spread of tuberculosis in the organism.

Various states of the atmosphere—altitude, temperature, humidity, season—may be predisposing factors. Although consumption occurs in greater or less degree in all localities it is more prevalent in variable climates and where there is much moisture. It seems to prevail inversely as the altitude progresses above sea-level. A rare atmosphere strengthens pulmonary respiration by requiring greater effort in breathing. Long-continued heat predisposes by depressing the vital powers.

Other factors have to be considered as concomitant. The more

isolated and less densely populated a region the less there is likelihood of infection. Climates are modified, in general favorably, by trees, rocks, rivers, lakes, drainage, winds, rains, the proportion of sunshiny days, and the like. Vegetation has an important regulating effect, modifying the winds, equalizing the temperature and diminishing the dust.

Animal life depends upon the free oxygen contained in the air. Pure air is essential to normal metabolism—the conversion of oxygen and the food-stuffs which are ingested into healthy tissues. An imperfect supply of oxygen results in various degenerative changes in the tissues and increases susceptibility to infection.

Humidity in the atmosphere is related to animal perspiration. When the temperature is low the sweat usually evaporates as rapidly as it is excreted, so that it is “insensible perspiration.” As the humidity increases, sweat may transpire, but its evaporation is pro-



FIG. 17—Hester Street, New York City.

gressively delayed, until, when the humidity reaches the saturation point the skin remains constantly wet. This reduction in evaporation diminishes the natural heat dissipation, so that with a high relative humidity, low or high degrees of temperature are poorly borne. Great humidity, by interfering with normal heat regulation of the body, may indirectly favor the taking of cold, and, by devitalizing the tissues, favor the development of infectious processes. Sickness is in general more prevalent in variable seasons. There is more illness in March, for instance, than in January, when the weather is more uniform. Consumptives, by the way, do better in the winter months than in the summer. Marine climates, though ideally bacteria-free, are apt to increase coughs.

A very dirty atmosphere may be a predisposing factor. Dr. Woodbury, the New York City street-cleaning commissioner, has most strikingly demonstrated this by means of pairs of plates which were exposed for an equal number of minutes in various parts of that city. Dr. James Ewing, of the Cornell Medical School, prepared some sixteen of these plates for him. Of two such plates one would represent atmospheric conditions in densely crowded districts, the other in a very clean part of the town. One of these, for instance, which was exposed at the corner of Hester and Ridge Streets, at market time, is saturated with bacteria, moulds, fungi, etc.; its fellow, which was exposed for the same number of minutes at Madison Avenue and Sixty-sixth Street, is almost wholly free from impurity (Figs. 18, 19). The former is a very unclean district; the latter is very salubrious.¹

A soil which is clayey, or moist, or marshy, or not well drained, is unwholesome. Healthful soils are sandy, loamy, or gravelly; such are warm and dry and readily drain themselves, especially where there is a slope.

¹ Miguel gives the following table:

NUMBER OF BACTERIA FOUND IN A CUBIC METRE OF AIR.

In the sea, at 100 kilometres from the coast	0.6
Altitude of 2000 metres	3.
Summit of Pantheon	200.
Observatory of Montsouris	480.
Rivoli Street (in Paris)	3,480.
New house	4,500.
The air of sewers of Paris	6,000.
Old house	36,000.
Hôtel-Dieu (hospital)	40,000.
Pitie Hospital	79,000.

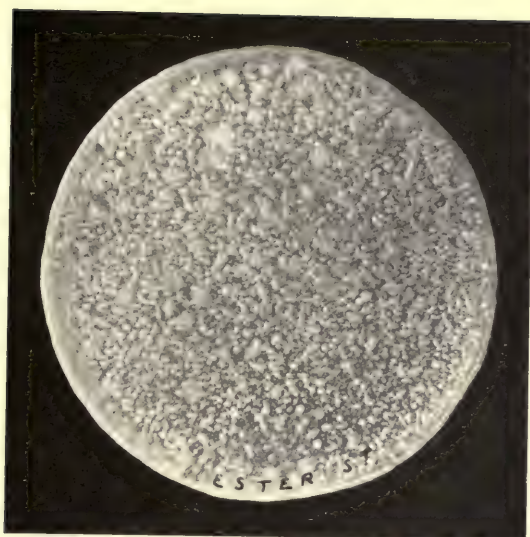


FIG. 18.—Hester Street, New York.

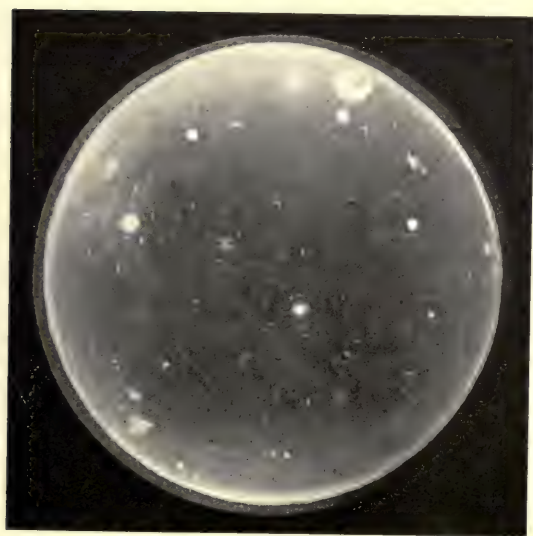


FIG. 19.—Madison Avenue and Sixty sixth Street, New York.

CHAPTER VI

RURAL DISTRICTS

God lent his creatures light and air,
And waters open to the skies ;
Man locks him in a stifling lair,
And wonders why his brother dies.

O. W. HOLMES.

THE physician, whenever it can be done, sends the consumptive into the country, believing that in the enjoyment of the benignant sunshine and in the pure air, with rest, good food, and drink, he stands the best chance of recovery. And he does stand the best chance under such conditions. But many inhabitants of rural districts, nevertheless, die of consumption. And we have to try and understand why such is the case. Sometimes it is the execrable diet, to which meats other than bacon are practically strangers—canned fruits and vegetables and condensed milk being largely consumed, the fresh food-stuffs, including eggs, being reserved to be sold in urban markets. I write from experience. When I was sixteen—it is longer ago than I like to remember—I taught school in a backwoods district for four months, and “boarded ’round.” In all that time I did not taste meat other than bacon, I never ate an egg, and the only milk I drank was with my tea.

Then there is oftentimes in the country a seemingly innocuous imbibition of stomach bitters (which generally contain a very fair percentage of alcohol), of cider, and perhaps other insidious fluids (Appendix B). These conditions may seem more virtuous and more soothing to the conscience, but they are not in many cases essentially different from the inordinate alcoholism which lays the foundation of tuberculosis. Indeed, when cider becomes old and hard, there is nothing to be found in the city grogshops more “paralyzing.” Then we must mention the effect of intermarriage through several generations in families living within a few miles square, and of certain evils which have been reported by such accurate and responsible journals as the *New York Evening Post*¹ to an extent really startling. Then we must refer, also, to a lack of regard to the bodily function which often

¹ November 8, 1903.

obtains in the winter months through disinclination to venture to outhouses in the intense cold. Poole relates the following :

The farm cure plain and simple is not enough. A friend of mine sent one young Russian to a farm last March to be cured by Nature. The plague was only beginning. The time was right ; the place was wrong. At the end of the month a series of letters began, of which I quote bits that tell the whole story : “ i am improving very nice—i aint coughing no more—i am getting fat—i sleep good and i have a good appetite to eat—i gained sixteen pounds—the country doctor here says the only thing i Need is *plenty of exercise work all day plowing and planting on the farm*—so i do. when i earn enough i will bring my wife and baby—it is a regular paradise—i will live here always—the faivers you have done to me will never be forgotten.” Two months later : “ you write me not to work hard. you know as long as i am harness up i must pull—my wife and baby are here and feel good—i will answer your questions—i cough again bad—appetite no good—sleep no good—sweat nights no—fever yes.” Ten days later : “ i am coughing something terrible —werst i ever did.” He died.

Clement, a French rural physician, records that in the sparsely settled country district, which is the field of his labor, there is much tuberculosis. He believes cattle to be the main source of the disease in this region ; alive, through the milk and its products ; dead, through the insufficiently cooked meat. The latter comes from animals slaughtered clandestinely to avoid the loss sustained by taking them to the official shambles, where the government offers an insufficient indemnity.

Such considerations as these may explain how it is that many in the country do not get well of consumption, but, on the contrary, die of it. Years ago, when the erection of a sanatorium in a mountainous part of New York State was contemplated, an inhabitant of that region was surprised. “ Expect to cure consumption here ? ” said he. “ Why, the people here don't die of anything else.” Nevertheless, the sanatorium was built, and thousands of consumptives have got well while living in it. But they have been under the direction of wise physicians who have taught them wholesome living and the value of hygiene, and have secured for them good, substantial food and drink, in addition to the fresh air, the sunshine, and the pure water which Providence has vouchsafed so generously in this region.

Part IV

SOCIOLOGICAL

And is man any the less destroying himself for all this boasted brain of his? Have you walked up and down upon the earth lately? I have, and I have examined man's wonderful inventions. And I tell you that in the arts of life man invents nothing, but in the arts of death he outdoes nature herself, and produces by chemistry and machinery all the slaughter of plague, pestilence, and famine. The peasant I tempt to-day eats and drinks what was eaten and drunk by the peasants of ten thousand years ago, and the house he lives in has not altered as much in a thousand centuries as the fashion of a lady's bonnet in a score of weeks. But when he goes out to slay he carries a marvel of mechanism that lets loose at the touch of his finger all the hidden molecular energies, and leaves the javelin, the arrow, the blow-pipe of his fathers far behind. In the arts of peace man is a bungler. I have seen his cotton factories and the like, with machinery that a greedy dog could have invented if he wanted money instead of food. I know his clumsy typewriters and bungling locomotives and tedious bicycles; they are toys compared to the Maxim gun, the submarine torpedo-boat. There is nothing in man's industrial machinery but his greed and sloth; his heart is in his weapons.

BERNARD SHAW

CHAPTER I

ECONOMICS

Would you persuade? Speak of Interest, not of Reason.—POOR RICHARD.

“TUBERCULOSIS causes annually more than 150,000 deaths in the United States at the average age of thirty-five years. At this age the normal after-lifetime is about thirty-two years, so that the real loss of life covered, measured in time, is represented by 4,800,000 years per annum. If we assume that the net value of a year of human life after the age of thirty-five years is at least \$50, the real loss to the nation resulting from the disease (a large proportion of which is known to be needless) may be estimated at \$240,000,000 per annum. These astounding and almost incomprehensible figures are far from being an exaggeration; but let us assume that only one-half of this mortality is preventable, and we have a net possible saving to the nation of \$120,000,000 per annum. This estimate does not take into account the social, moral, and sentimental value of at least 100,000 lives, which, under different conditions, might reasonably hope to continue for many years. The mortality from tuberculosis is, therefore, a problem compared with which all other social problems of a medical character sink into insignificance, and it is safe to say that the possible prevention of a large portion of the mortality from this disease is justly deserving of the solicitude, the active personal interest, and liberal pecuniary support of all who have the real welfare of the people of this nation at heart.”¹

Osler computes that there are at least a million and a quarter cases of tuberculosis in the United States all the time,—certainly a very conservative figure. These are all more or less in the position of invalids, and all, if they hope to recover, should be able to maintain that rôle for at least a time. Assume that one-fourth of them cannot work; they must then be supported in some other way than by their own efforts, either by private or public help. In many cases they are

¹ Statement by Frederick L. Hoffman, Esq., actuary of the Prudential Life Insurance Company, of Newark, N. J., to whom, and to Miss Lillian Brandt, the statistician of the Charity Organization Society, New York City, I am indebted for many of the data in this part.

heads of families and have wives and children dependent upon them, who likewise must be cared for. The wages then of these one-fourth, or 312,500 men, at the rate of \$1.50 a day, would amount to over one hundred and forty million dollars in a year. This represents the sum lost annually by the nation because these men are unable to work. If there were such a leak in our resources from any other cause which was preventable, there would be a continual agitation until it was remedied. The loss of \$50,000,000 annually paid to foreign ship-owners caused a ship subsidy bill to be considered, calling for an annual expenditure of \$9,000,000; yet here we have an annual loss of three times as much in money, and pain and suffering beyond description, but not one dollar is appropriated, and not one step taken to remedy it.¹

Seven thousand persons died of consumption in Illinois in 1903, half of them between the ages of twenty and fifty years, while the estimated loss to that State alone, because of this disease, was \$36,000,000, and the medical authorities of that State have, as elsewhere, found that consumption is responsible for more deaths than typhoid fever, scarlet fever, diphtheria, all forms of bronchitis, influenza, measles, and smallpox combined.

Dr. H. W. Thomas, of Chicago, computes that the loss of money in Illinois invested in the raising of children who die of tuberculosis under the age of twenty is \$1,187,800; the loss from inability to perform labor on the part of the consumptive, \$30,000,000; the loss of savings of those who die before the end of the producing age, \$5,139,000; and the cost of the care of those sick and comparatively helpless from consumption, \$225,000. Upon this accounting, then, tuberculosis costs the State of Illinois, yearly, \$36,551,000.

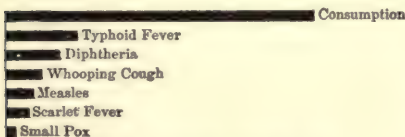


FIG. 20.—Deaths in Illinois, 1903.

The Ohio State Commission computed that in that State there are some 6,000 deaths annually. "If allowed to go on unheeded, fully 400,000 of those now living in Ohio must die from this disease." The resulting economic loss is \$7,000,000 a year; the losses to this State from the withdrawal from work are over \$8,000,000. Among orphans in nine institutions nearly one-fourth lost their parents through this disease.

¹ Pottenger.

The Indiana State Board shows seven hundred and ninety deaths among mothers between eighteen and forty in one year, and four hundred and twenty-five fathers between the same ages, leaving 2515 orphans under twelve, and 1215 homes fatherless or motherless.

The New Hampshire Commission, studying the deaths by decades of age from 1884 to 1901 inclusive found that the two decades which marked by far the greatest number of deaths are those between twenty and thirty, and from thirty to forty years,—periods when the individual is of most value to himself, to his family, and to the State.

The Maryland Commission finds the following:

“The average individual loss entailed by the disease for each wage-earning male dying from tuberculosis in Maryland, is \$741.64.

“The average potential loss to the community entailed by the death of each wage-earning male, is \$8,512.52.

“The total potential loss to the State entailed by the deaths from tuberculosis each year cannot at the very lowest estimate be less than ten million dollars.”

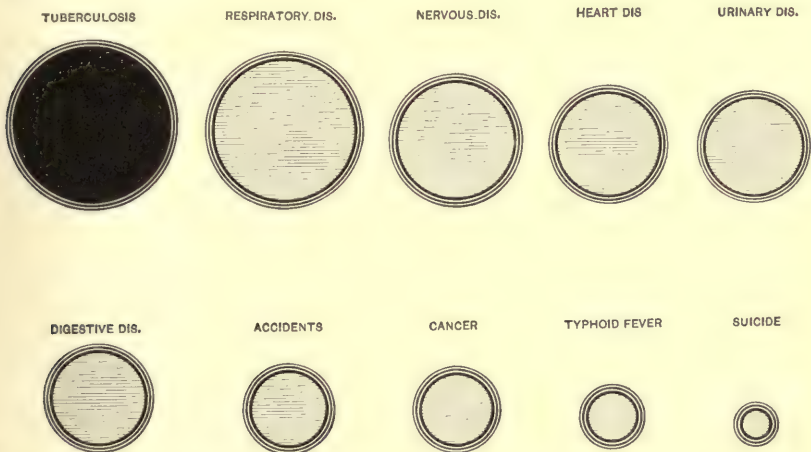


FIG. 21.—Mortality from ten principal causes, white males and females. (Hoffman.)

There are yearly more than 10,000 deaths from consumption in New York City; and at least thrice that number of sufferers. Biggs estimates the loss from tuberculosis to this community as follows: During the last twenty years the reduction in the death-rate in this city from tubercular disease has been nearly forty per cent. “The total number of deaths in 1901 ascribed to this disease in New York City was 9412. For the Boroughs of Manhattan and the Bronx alone, concerning which we have more accurate data for a series of years, we find that during the past twenty years there has been an actual

decrease in the total number of deaths, notwithstanding an increase of population: that is, in 1881 the deaths from the tuberculous diseases in the Boroughs of Manhattan and the Bronx numbered 6123; in 1901, twenty years later, they numbered 6051. During this time the population of these Boroughs had increased nearly 70 per cent.,—*viz.*, from a little over 1,200,000 to more than 2,100,000. Taking now the deaths for the whole of New York City, annually, at 10,000—as we may safely assume that several hundred deaths each year which should be ascribed to the tubercular diseases are ascribed to some other cause—we may estimate the economic loss to the municipality. It may be conservatively estimated that each human life at the average age at which the tubercular deaths occur is worth to the municipality \$1500. The cost of each life at this age is usually more than this. This gives a total value to the lives lost annually of \$15,000,000.

“We may further assume that for an average period of at least nine months these persons are unable to work and must be cared for. The loss of their service during this period may be estimated at \$1 a day, and the cost of food, nursing, medicines, attendance, etc., at \$1.50 more per day, making a further loss of \$2.50 per day, for each person dying, for a period of 270 days. This gives us a further loss to the municipality of \$8,000,000, making a total annual loss to the city from tubercular diseases of at least \$23,000,000. It has been estimated that in the United States annually not less than 150,000 deaths are caused by the tubercular diseases, and estimating the value of these on the basis just given, we have an annual loss to the country of more than \$330,000,000.”

Biggs estimates that the annual expenditure of a small part of this sum would result in a very rapid decrease in the prevalence of the tuberculous diseases in this country. And his opinion is weighty, for he has had an enormous experience in the sanitary supervision of infectious diseases in New York City covering many years. He has had made a census of the cases actually under treatment in the hospitals in New York City annually for a series of years, and the total number never much exceeded 1000, or less than four per cent. of the cases actually present in the city. The vast proportion of the remainder are in tenement houses.

“I have estimated that the total expenditure in the city of New York in its public institutions for the care and treatment of tuberculous patients is not over \$500,000 a year, or not more than two per cent. of the actual loss to the city annually. If this annual expenditure were doubled or trebled it would mean a saving of several

thousand lives annually, to say nothing of the enormous saving in suffering." ¹

Conditions in the United States demonstrate that the mortality from consumption is greater in cities than in rural districts.² However, the fall in the death-rate during the ten years ending in 1900 has been 24 per cent. ; and the ratio of decrease has been six for the cities, as against not quite five for the country. This ratio is surely due to the greater improvement in conditions of city life.

The condition of things in cities generally may be inferred from that which obtains in New York. Here from the fifteenth to the thirty-fifth year, one-third to one-half the entire mortality results from tuberculosis. And these official figures do not begin to represent the limit. Thousands of cases are not reported to the authorities, for various reasons.

For instance, up to very recent years, and to some extent even nowadays, mutual benefit societies have refused to pay claims when death was ascribed to consumption ; and such also has been, to a measurable degree at least, the practice of some life insurance companies, a large part of whose business is the writing of "industrial" policies. (It is not so nowadays among the important companies.) At any rate, it has been the well-nigh universal impression among the poor that claims would be refused under this circumstance. So that physicians have many a time been importuned by wretchedly poor people, who, fearing the loss of the few dollars so desperately needed, would ask that "pneumonia," or some other cause of death, be entered upon the death certificate. And who shall say how often the contest in the physician's mind between humane instincts, however mistaken, and strict honesty has resulted in the committing of a venial sin,—sufficiently often to suggest the inference that such deaths from

¹ Handbook of the New York Charity Organization Society.

² Such data as are here set forth concerning the United States are for the most part based upon conditions in the "registration area." Populations of less than 8000 are considered to be in rural districts. In the presentation of results in the Federal Census those States and cities whose registration records gave evidence of being the most nearly complete were classed together as the registration area. The total population of the registration area amounted to thirty-eight per cent. of the population of the United States. It comprised the States of Connecticut, Maine, Massachusetts, Michigan, New Hampshire, New Jersey, New York, Rhode Island, Vermont, and the District of Columbia, and included so many of the important cities throughout the country that it may be considered fairly typical. It is probable that the superior accuracy of the returns from this area makes them ordinarily more truly indicative of the country as a whole than are the defective returns given for the whole United States.

consumption have been many more than have been set down in the statistics? No doubt many deaths recorded as from other respiratory diseases have consumption at bottom.

Again, ignorant and stubborn people have tried not to have cases reported as consumption, fearing registration and the application of such wholesome and enlightened administrative rules as are calculated to protect survivors in the community—measures which

really are not inconvenient. Even physicians have condoned such concealment, on which account many deaths from consumption are unrecorded.



FIG. 22.—Deaths from consumption in Illinois, 1903, by ages.

communities. And in the accompanying circles Miss Brandt has exhibited a like proportion. It is really pitiable to observe the number of deaths in adult life from a preventable disease. There is, as we observe, between the years indicated a somewhat greater mortality among men than among women. This must be attributed mainly to the fact that men have more strenuous and dangerous occupations.

Hoffman observes that while the mortality among males in cities has been twenty-one per ten thousand, as against sixteen for females—a difference in favor of females of five per ten thousand of population—in the country districts the death-rate has been twelve for males, as against fourteen for females,—a difference in favor of males of two per ten thousand population. The mortality of males in cities is higher than the corresponding mortality of males in rural districts; also the mortality of females in cities is higher than the corresponding mortality of females in rural districts.

Still, conditions tending to tuberculosis have bettered in cities and the percentage of deaths from this disease has been less in proportion than in rural districts. However, not only the tuberculosis death-rate has to be considered, but also, and indeed much more, the condition of the living who suffer from it, and “the causal relation which this disease maintains towards many other social problems.”

Before the fifteenth year there are comparatively few deaths from

tuberculosis, although there has been in infancy and childhood at least as much danger of infection as during any other period of life. The prohibition of child labor, which now generally obtains in this country, has here, no doubt, been effective. Young constitutions, which must formerly have been weakened to a degree of susceptibility to infection, now reach a measurably vigorous maturity. Many children have now no longer to endure the disease-engendering conditions of factory-life and indoor occupations. Children are now but little employed in

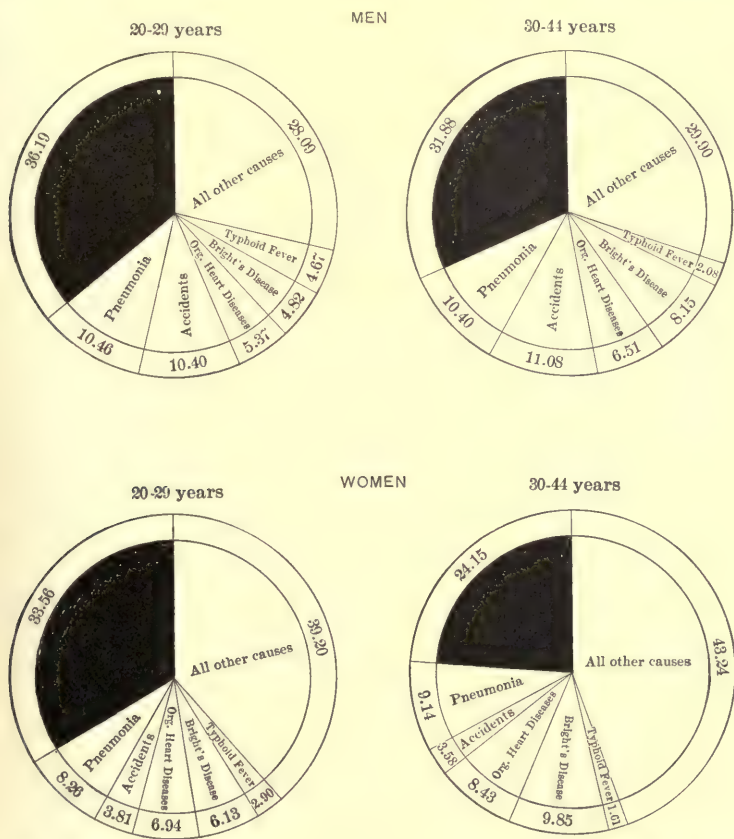


FIG. 23.—Proportion of mortality caused by consumption in New York City, 1901. (Brandt.)

pottery and glass work and like industries which are particularly conducive to tuberculosis and other respiratory diseases.

Moreover, conditions in school-life have been very materially improved. Close, overheated schools have given place to large, airy, well ventilated and properly lighted structures. However, conditions are as yet by no means ideal in schools. In attending a public-school

reception one will observe how in singing the expressions on the faces of many children are strained, as if singing were an effort for them. These children have adenoids, hypertrophied tonsils, or otherwise unhealthy upper air-passages. Such are mouth-breathers, starved for oxygen,—ideal conditions predisposing to tuberculosis.

With regard to mortality from consumption among the single, the married, and the widowed. As a general proposition it is lower for

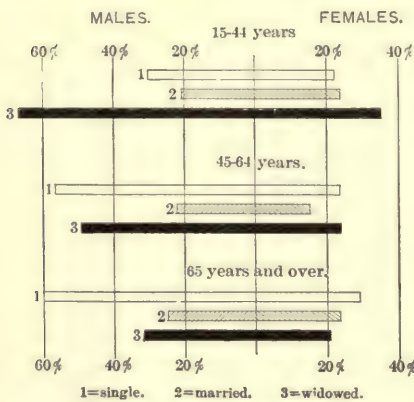


FIG. 24.—Mortality among single, married, and widowed. (Brandt.)

the married than for either the single or the widowed and lower for women than for men. Brandt finds that the only time when the death-rate is higher for women than for men is among the married between the ages of fifteen and forty-five years; and here it is also higher than for single women during the same ages. These data are in large part explained by the development of consumption as a sequel to exhausting and frequent pregnancies. The highest death-rate of

all is among the widowers under forty-four years. After the forty-fifth year the rates for both widowers and widows, while higher than for the married, were lower than for the single. Hoffman observes that the death-rate among widowers is highest at the youngest ages, while lowest at the most advanced periods of life. The higher mortality of widowers at early ages is the result of disease transmission from wife to husband. Conversely, there would seem to be a lesser liability in the transmission of the disease from husband to wife; possibly because the husband is away from home a large part of the time, while the consumptive wife being so much more at home, infects the household the more. Widowers have a much higher mortality than widows at corresponding ages,—at ages up to forty-four years, sixty-seven against thirty-six; from forty-five to sixty-four years, forty-nine against nineteen; from sixty-five years on, thirty-one against twenty-one.

The high death-rates among the single are largely due to occupations; to the fact that a far higher percentage of the single than the married live in cities, where the devastation is much greater than in the rural districts; and to habits of life detrimental to longevity, such as alcoholism, to which the single have more temptation than the married. This last factor may tend also to explain the greater mortality

among the widowed than among the married. And the favorable mortality enjoyed by the married is certainly due in large measure to this institution being inherently a process of natural selection towards which only the fit tend, and also to the greater regularity and soberness of living essential to matrimony. Particularly is this so of consumption, a disease which thrives upon irregularities and exposures.

The English National Association for the prevention of consumption finds upon investigation that one-eleventh of all the pauperism, costing in England and Wales £10,500,000 a year, arises from consumption; that one-quarter of all deaths during the wage-earning age (fifteen to fifty-five) are due to consumption, leaving many widows and children to receive aid from poor laws, friendly societies, and charity organizations. The average age at death of sixty-two consumptives dying in Kendal was thirty-two, and of five hundred and seventy-four dying in Edinburgh was thirty-three. This is a loss of ten years of labor at an average wage power of £35 per year, a loss of £350 per life. In Brighton Workhouse, during three years, two hundred and eleven consumptives stay an average of forty-five weeks at seven shillings a week, costing £3300,—that is, £1100 a year for maintenance alone. The eight thousand consumptives in English workhouse infirmaries, when bearing their share of establishment and other expenses, cost £600,000 a year or £75 per head. If consumption were abolished the average duration of life of persons who reach the wage-earning age of fifteen would be increased by three and one-quarter years.

Consumption is so costly to companies insuring against sickness (consumption accounting for more than one-half of those incapacitated at thirty years of age) that in Germany these companies find it pays to send nine thousand workmen in a year to consumption sanatoria for an average of eleven weeks at a cost of a guinea and a half per head per week (a total of £153,000) in order to restore them to wage-earning power.

The German Imperial Insurance Office reports that of every one thousand German workmen between the ages of 20 and 24 years who are rendered unfit for work, five hundred and forty-eight are so disabled because of tuberculosis, and of those between the ages of 25 and 29 years, five hundred and twenty-one are rendered so because of this disease. When, then, the bread is taken from the mouths of those dependent upon German workmen, in more than 50 per cent. of the cases it is through tuberculosis. What is thus true of Germany would doubtless hold regarding other countries, were the necessary data at hand for comparison. Tables arranged under the supervision of this Office further show that in a total of 155,462 pensioners, of male

workers employed in mining, metallurgy, industry and building who become invalid up to the age of 30, *more than half suffer from consumption*. The proportion of the female pensioners in the same avocations is just as unfavorable at the age of 20–24, while at the age of 25–29, almost half of all invalid women of these avocations are consumptive. People engaged in forestry and agriculture do not so readily suffer; yet among 1000 male pensioners thus employed there are more than 350 of the age of 20–24. For the totality of the other professions, the proportion of invalid men of the age of 20–30 is such that out of 1000 cases of invalidity, 450 are pulmonary consumptives, while about a fourth part of all invalid women of the same age and professions are like sufferers. From these results, and also by the statistics of the Health Board for the year 1893, it is proved that of every 100 persons who died at the age of 15–60 in the German Empire, 33 have fallen victims to consumption.¹

Cornet computes that in 1894 there were in Germany 116,705 deaths from diphtheria and croup, whooping-cough, scarlet fever, measles, and typhoid fever combined; from tuberculosis there were 123,904 deaths. These latter deaths were to an extent of more than seventy-five per cent. from bread-winners, whose ages ranged from fifteen to seventy years; in this respect consumption differing quite radically from the other diseases mentioned. In Prussia, consumption produced one-third of the entire number of deaths. And Cornet reminds us that tuberculosis runs a number of years before it proves fatal; but if we reckon the invalidism due to it to be only one year, and the average loss of wage (on unemployed labor) at a value of two marks per day, then the loss of earnings for each person per year, three hundred working days to the year, amounts to six hundred marks; so for the total number of those who have died in the bread-winning period of life, 71,895 persons, the loss of earnings amounts to 43,137,000 marks annually. "If we add to this figure the money for doctors and medicine, for food and care (counting that the sick pay out 2.19 marks per day), for burial, and furthermore, the expenditure for invalids not included among bread-winners, we may estimate at least twice as much as the previous figure, or 86,000,000 marks as the yearly cost to the Prussian State. Consumption therefore demands an annual increase of the tax of 3.09 marks per capita, or of fifteen marks for each family of five in the Prussian State."

These figures and the economic data here set forth are impressive enough; but upon reflection, how about their connotations? Such

¹ Bielefeldt.

deaths are among those in the prime of life, and between the ages when men and women are most valuable to themselves, to their families, and to the State. Let us dispel for a moment the sense of economic loss which these figures represent, and consider what they mean in distress and illness antecedent to death, in torture of heart and mind to the survivors, and the inherent likelihood of infection and sickness for these latter. There is truly no other single factor, no other destructive agency—catastrophe, pestilence, blight, or warfare—which typifies to the extent that this disease does the pathos of existence and the cold indifference of Fate to human suffering.

CHAPTER II

RACES AND PEOPLES

Effertz has been traveling unfrequented paths the world over for more than twenty-five years, and has been particularly interested in studying the comparative pathology of different generations and races. He has been much impressed with the variations in the frequency and virulence of infectious diseases.—JANUS, Utrecht.

THE negro is exceedingly prone to consumption, which destroys every other adult among his people. It would seem, however, that the disease was unknown among the blacks in Africa until comparatively recent generations, when the exploring whites decided to confer

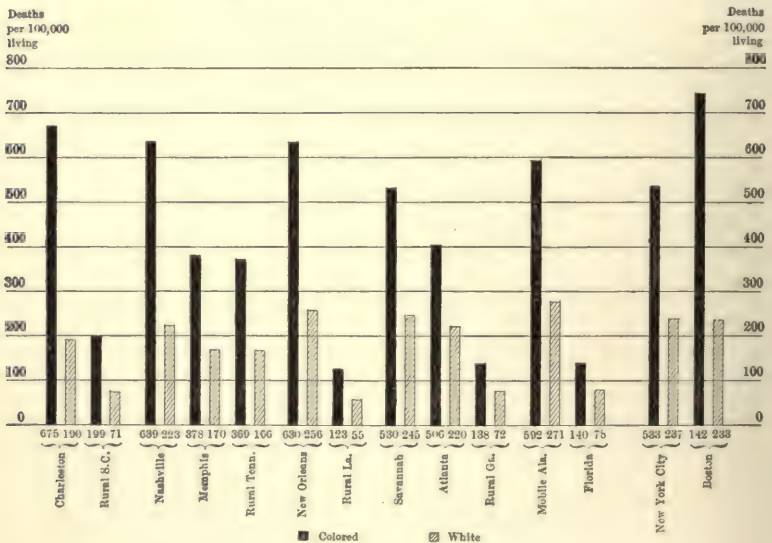


FIG. 25.—Death-rates from consumption, 1900. (Brandt.)

upon them certain prearranged blessings of civilization. Their immunity is probably due to the fact that barbarism does not suffer the disadvantages of badly ventilated, badly drained houses, indoor and factory life, and like conditions of civilization upon which tuberculosis thrives.

Harris declares that before the Civil War tuberculosis was almost unknown among the slaves; that it does not occur on the West Coast of Africa, except when it has been imported by the white race and acquired by the negroes living in semi-civilized life. Millard states:

“I have excellent authority for saying that the disease is rare among the negroes in Africa, and in the interior is almost never known.” Flick considers that the negro race in Africa was free from consumption until it began to associate with other races.

No doubt tuberculosis has taken the same course among the negroes as did measles among the Fijis. The latter was entirely unknown among these people until some whites who came there introduced it. On account of this the aboriginal inhabitants died off in enormous numbers of this disease, which is now comparatively innocuous among us,—40,000 Fijis in a population of 150,000. This exemplifies the established fact that a light infection acquires an unusual malignancy when for the first time it invades a race previously immune. On the other hand an infection tends to lose its virulence in the course of centuries, as with the Jews, who are singularly less prone than other races to tuberculosis.¹

Flick considers that the history of consumption in all new countries into which it has been introduced shows that it has had a rise, a climax, and a decline in prevalency, citing the experience in the islands of Madeira and Bermuda and the progress of the disease from east to west in the United States in illustration of his view. In New York City, from 1804 to 1820, the deaths from consumption were one in 4.2; from 1820 to 1835, one in 5.4; from 1835 to 1850, one in 6.5, and from 1848 to 1859, one in 8.4. In Rhode Island the percentage of deaths from consumption was, in 1867, 20.74; in 1883, 15.03. The mortality statistics of the older States and cities show in the same way a progressive decrease; those of the newer States and the Territories show either a standstill or a decrease. “The avidity, however, with which the disease takes hold of new material illustrates its subservience to the law of acclimatization better even than its history in different countries. It has decimated the natives of probably every island which has been colonized by England during the last few hundred years.” The native-born African negroes have thus suffered terribly from it. In Egypt the negroes and Abyssinians are decimated by it. In Gibraltar for twenty years the comparative deaths between whites and blacks have been per 1000: Whites, 6.1; blacks, 33.5. During the early American slave trade the proneness of the negro to consumption was noted by Rush and others.

Certain habits of the negro are certainly predisposing. The following observations are illustrative: I several years ago visited the island of New Providence, in the Bahamas, most of the inhabitants of

¹ Billings, Körosi, Fishberg, Hoffman, Brandt, Flick.

which are negroes. There, as elsewhere, they are an extremely superstitious people, to which habit of mind the conditions of nature in that region are certainly conducive. In the interior of this island I found huts ensconced in luxuriant vegetation which sprang from ground made up of hard coral formation,—shrubs, weeds, vines, flowers, moss-covered magnolias, live oak “cottons,” orange, pineapple, mangrove, and gum trees making up a dense jungle, with here and there a solitary cocoanut tree looming up many feet, its leaves being turned all one way by fierce winds that blow unchanged during most of the year. There are sudden and most destructive hurricanes, and the thunder and lightning which accompany them are certainly awe-inspiring and must be very terrifying to the primitive mind. During such hurricanes many of these negroes perish while sponge-fishing despite the fact that they engage certain of their people to keep fires burning at home, over which they speak incantations calculated to protect against the elements while the sponges are being gathered.

Hardly less weird than the fierce aspects of nature are those she assumes in her periods of quiescence. Many feet below the surface in the harbor of Nassau the water is of the hue of the emerald and of the translucency of the diamond. The variegated life in the coral beds is easily contemplated from a boat. Standing upon coral-reefed shores at midnight one sees the Saragossa sea-grass floating by continuously, glistening kaleidoscopic in the moonlight; enormous yellow-backed turtles propelling themselves lazily; flying-fish gleaming in long, rapid curves; chambered nautili sailing by upon the lightest imaginable zephyrs, ivory-colored, or pink, or diaphanous blue; a solitary pelican, poised one moment high in the air and then swooping lightning-like and disappearing into the water, to come up with a struggling victim in its beak. And all this in the midst of most eerie, wondrous stillness. Little wonder then that the negro in these parts peoples the earth, the air, and the water with beings inimical to soul and body.

I have been told by our consul at Nassau, on this island, that it is a custom among the negroes in that region, no matter how hot the nights might be, to keep the doors and windows of their huts tightly closed, and to burn lamps or candles throughout the night to keep the evil spirits out and to scare them away. Such superstitions as these are common also, I believe, among negroes in our Southern States. The negro, moreover, eats much pork, and swine are among the tuberculous animals. To say the least, this is an unhygienic diet for hot regions. The negro is said to be inordinately prone to alcoholism;—if so, this factor should predispose more than among the

whites, for the same reason that obtains among the Indians, to whom I will presently refer.

Coleman declares the negro to be unusually ignorant of hygiene and averse to water; that his food is often insufficient and unwholesome and unsuited to the climate in which he lives; his clothing is unhealthful; he is shiftless and improvident. Syphilis and gonorrhœa, by weakening the system, render many susceptible to tuberculosis. Many a negro now works indoors, and the houses in which he lives are overcrowded,—unfortunate conditions, since the tendency of his race has been agricultural and toward outdoor life.

Harris considers that the negro's small lung capacity, as compared with that of the white, and his deficient brain capacity render him less resistant to the disease when once acquired. Where the two races live together, three times as many negroes as whites die from tuberculosis. And Harris and Coleman both conclude that unless the hygienic and moral surroundings of the race are improved there is danger of its extinction.

It seems that the Indian was free from tuberculosis before his contact with the whites, living as he did in the open air and without alcohol. The "fire-water" introduced by the white man (a most vicious, impure, cheap and harmful form of alcohol) has certainly been a large factor, all the more for the reason that the whites have, through many previous centuries, rendered themselves comparatively seasoned with regard to this stimulant, to which the Indian has not yet accustomed himself.

Rush¹ stated more than a century ago that consumption was then unknown among the Indians of North America. Flick considers that prior to the advent of the white man—and especially the Englishman—consumption did not exist among the American Indians. Wherever England colonized the Indians took the disease, so that in the course of time it became even more prevalent among them than among the whites. The disease increased from east to west. John D. Hunter, who was for fifteen years a captive among the Indians, wrote in 1822: "I have known pulmonary consumption to occur among the Indians. It is rarely seen, however, except in those who are addicted to intemperance, and even in those cases it is by no means as common as among the whites. It is worthy of notice that their females are not as much subject to the disease as the males are."

In 1854 George B. Buckley reported that Indians east of the Rockies suffered from inflammation of the eyes and consumption. In

¹ Flick, "The Contagiousness of Phthisis."

1870 Dr. Thomas Williams wrote of the Dacotas, of Minnesota, that "of those over ten years who die of disease, I think one-half die of consumption." It has almost exterminated some American tribes.

The death-rate from consumption among Chinese in this country is, I believe, very high indeed. As regards New York City, their dreadfully unhygienic living, their sleeping in bunks, in vitiated atmospheres, their overcrowding, their addiction to opium and other enervating vices, and like circumstances abundantly explain their high mortality from tuberculosis.

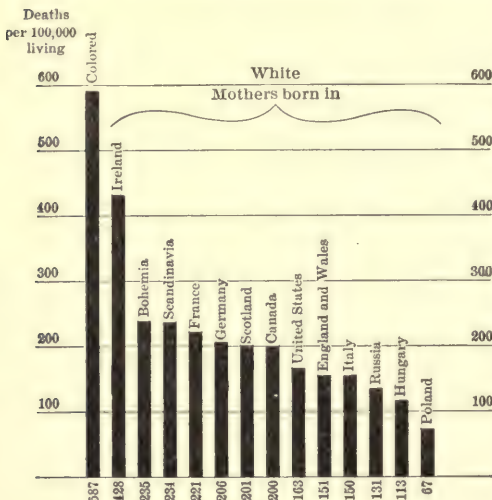


FIG. 26.—Mortality by races. (Brandt).

Brandt, to whom I am indebted for the accompanying diagram, considers that high mortality among the Irish people is no doubt due to the inordinate alcoholism which obtains among their poor, their careless, improvident

nature, their inheritance of poverty through many generations, and the overcrowding among them in our tenements.

The Bohemians come next, though a long way behind; their habit of congregating in cities, their unhealthful housing conditions, and their indoor occupations explain their mortality rate.

The Scandinavians are reputed a healthy race, and so no doubt they are at home. However, the effect of new climatic conditions upon them and the formation of a radically different physical type in the second generation may account for their comparatively high mortality in this country. Until we reach the Italians the conditions are such as prevail in civilization generally, and no observations are strictly pertinent.

We would expect a higher mortality among the Italians, for their indoor life in New York City is very unhealthful; they are exceedingly dirty, and they are said to be much underfed. Moreover, being an ignorant and superstitious people, and no doubt fearing often the imaginary terrors connoted by registration, they are given to concealing their cases, so that by no means all are reported. This observation probably applies to many of the fifty odd tongues represented in New York

City. Many Italians want to die in their fatherland; so that numerous cases no doubt leave for home before they become very bad. Many poor Italians work in this country during the summer months and return to Italy in the fall. Besides, the Italian's nature is sunny, not given to worry, and these people are largely engaged in outdoor work upon public roads, peddling, etc.

Stone and Wilson, in giving the tuberculosis death-rate in Boston, state the percentage of parents' birthplace to be :

Ireland	16.20
Sweden	13.70
British America	13.30
Scotland	11.73
England	10.85
Germany	10.73
United States (including colored)	6.87
Italy	5.81
Russia	5.35

This table accords fairly well with that of New York and with similar statistics from other cities.

The Russians and the Poles in New York and elsewhere in the United States are, I think, mostly Jews. We observe that in Miss Brandt's diagram (Fig. 26) these people have the lowest death-rate. It appears, indeed, that the Jewish race in general suffers less from consumption than any other people, except perhaps the Quakers. And here I would ask the reader to turn to two maps made by Miss Brandt of lower Manhattan Island, which appear in the next chapter. I have exhibited these maps before scientific bodies, together with my opinions concerning them; and have been the recipient of a very choice collection of objurgatory brickbats during the discussions which have followed. I keep adding to my collection with unabated enthusiasm. These maps, as Carlyle might have put it, are indicative of much. The first shows various districts in which the density of the respective populations is represented. The darkest shading of all is put over the region of the lower East Side through which Grand Street runs. The region is occupied by the Jews, to the practical exclusion of all other races. In New York there are upwards of 750,000 Jews,—from one-fifteenth to one-twelfth of all the Jews in the world; and the vast preponderance of those in New York is to be found in the region just noted, the most densely populated, I believe, in the whole world, certainly in either Europe or America.

Now, with regard to the second map. Here the districts are outlined exactly as before. But the one among all of them which has no

shading at all is this same Jewish quarter,—that is to say : the Jews are more closely crowded than any other community ; yet tuberculosis is least rife among them. What does this overcrowding among the Jews connote? Practically every factor which is causative save three, which I shall presently set forth.

The very poor Jews are not cleanly in their personal habits, at least according as I have had occasion in my own dispensary experience to note. The proper disposition of sputum, such as present-day prophylaxis requires, is not practised by them. The air in the crowded tenements in which they live is in the last degree vitiated and unwholesome ; it is saturated not only with human exhalations, but also with smells emanating from ill-kept back-yard closets. Such air should surely be conducive to tuberculous infection. Out in the streets the air is also much vitiated, as witness Dr. Woodbury's experiment (page 84).

They work very hard indeed, do these poor Jews, most of them in sweat-shops. In violation of the law, children, as soon as they are old enough to thread a needle, are set to work. From early morning to very late at night, in their wretchedly ventilated rooms, do they bend over their machines. Their lungs expand but poorly ; “they have no chests.”

The first exception among etiological factors, to which I have referred, is the character of the food consumed by the Jews. While other peoples have comparatively little regard to what they eat and drink, I am positively assured that, with rare exceptions, the orthodox Jews, no matter how poor they may be, obey with strictness the Mosiac laws concerning food and drink. Oftentimes the meat which their religious officials reject as unsuitable for Jews to eat, is sold to Christians and eaten by the latter without thought of its possible impurity or of its effects upon metabolism. The Reverend Madison C. Peters, in his book, “Justice to the Jew,” states that nearly half the meat is thus rejected and thus sold in Christian markets.

Here appears to me to be evidence corroborative of the present-day scientific opinion that the alimentary canal is concerned in the spread of tuberculosis within the organism ; that even pulmonary tuberculosis results often from infection by means of bacillus-containing food-stuffs. We may, in comparing the enormous tuberculosis mortality among the negroes and the comparative immunity among the Jews, note that the meat of the former is almost exclusively pork, while the orthodox Jew will not eat this meat, which is likely to be tuberculous, much of the food of swine being the swill from cattle and the decayed products of dairies.

The second exception is that the Jewish race, during the forty centuries of its existence, must have achieved for itself a comparative immunity to consumption. This is in conformity with the principle we have just set forth, and which applies conversely to the negro.

Third, the Jewish people have no drink problem. They are said to be a temperate people with regard to alcohol, which they take, but in moderation. This factor is an important one, as we shall see.

CHAPTER III

OVERCROWDING

Mr. Lawrence Veiller, in describing the miserable surroundings of the poor in a city the size of New York, said that these evils were of man and not of God; that they were no part of nature or of nature's laws. He asked if it was necessary that in this modern city of New York 9,000 human lives be sacrificed each year to "the white plague," when all that was needed for its cure were fresh air and sunlight and wholesome food. Was it necessary, he asked, that from 75,000 to 100,000 members of the Jewish community be unable to supply themselves with the immediate necessities of life without the aid of charity, or that 34,000 children be deprived of the care and solicitude and devotion of a parent's love, and be brought up in institutions as wards of the State? Was it a sign of a healthy or a diseased civilization that the State pays annually \$25,000,000 for charitable purposes?

"To say that the lower East Side of New York is the most densely populated spot on the habitable globe gives no adequate idea of the real conditions. To say that in one section of the city the density of population is 1,000 to the acre, and that the greatest density of population in the most densely populated part of Bombay is but 759 to the acre, in Prague, 485 to the acre; in Paris, 434; in London, 365; in Glasgow, 350; in Calcutta, 204, gives one no adequate realization of the state of affairs. No more does it to say that in many city blocks on the East Side there is often a population of from 2000 to 3000 persons—a population equal to that of a good-sized village—and that in many such blocks the density is over 1,000 to the acre."—*N. Y. Evening Post*.

CONSUMPTION has been found to exist predominantly in congested areas.

With regard to New York City this map, made by Miss Brandt, presents "a seemingly anomalous situation." Below Fortieth Street, taking ward by ward, "the alternatives present themselves of denying to density any influence whatever, or of concluding that it is a powerful advantage." However, in explanation, certain things are to be considered. In many of the downtown wards, where the tenements are being displaced by business houses, the actual density of the part of the ward that is used for residence purposes is far greater than is indicated by the average number of persons per acre. Again, certain radical factors overshadow the influence of density. The Hebrew element to which we have referred gives the notoriously congested Tenth Ward a comparatively low rate of tuberculosis. For the same reason the Seventh, Eleventh and Thirteenth, which rank next the Tenth in density, have the very least consumption. In the

First Ward, where the average density per acre is low, the density per room is without doubt very high, since much of its area is occupied by warehouses and other buildings devoted to business purposes. The houses here occupied as dwellings are old and unimproved. This is the site of the Syrian colony, other inhabitants than these being chiefly Irish.

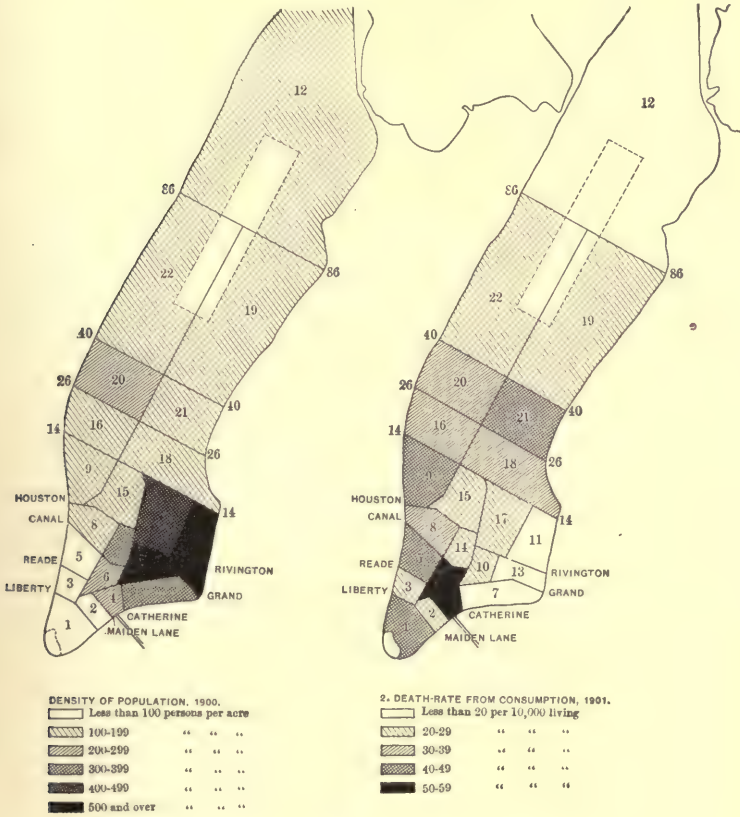


FIG. 27.—Borough of Manhattan by wards. (Brandt.)

The Sixth Ward contains Chinatown, and the rest of the ward is made up mostly of solid tenement blocks of the same dreadful type as the two that were razed some years ago in Mulberry Bend; hence the high death-rate from consumption.

The Fourth Ward is one of the oldest and most unsanitary districts in the city; the main element in its population is the lowest type of Irish-Americans, whose physical constitutions are weakened by excesses of all sorts on their own part and that of their parents. These

conditions prevail generally in the Ninth and Twenty-first Wards. In the Sixteenth and Twentieth there are large negro colonies.

The New York City Health Department instituted a system of voluntary notification of living cases of tuberculosis in 1894. From this registration of living cases, and from the records of deaths, we find that not only is consumption more prevalent in certain parts of the city than in others, but that in any given district it is concentrated in certain streets, blocks and houses. There are houses in which cases have occurred yearly for nine years past, as in the case of the "Lung Block," which I shall present.¹

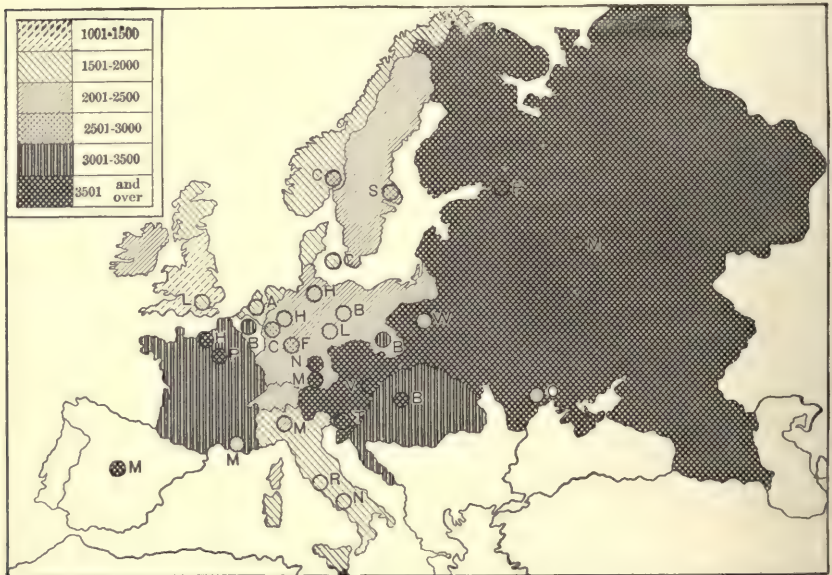


FIG. 28.—Mortality from tuberculosis of the lungs in European states per million living. (Koehler-Hillier.)

William Penn, lofty and generous spirit that he was, originally mapped out the "squares" of Philadelphia upon ample lines. The end he had in view was that the citizen should have not only a street in front of his house, but plenty of ground in its rear, upon which he and his might breathe fresh air, get a glimpse of the sky, and enjoy the sunshine. But modern ingenuity has nullified all that. The original street boundaries remain, but the space to the rear of the houses of many squares is choked up with structures designed for habitation, which are reached by means of blind alleys and like con-

¹ Stone and Wilson present valuable data akin to these concerning the city of Boston.

trivances. The resulting conditions are in the last degree unsanitary and subversive of human civilization.

In many parts of Washington the same state of things obtains. There is in this city, the magnificent capital of our country, a very high consumption death-rate, due to a large colored population, and to the unsanitary condition in which many of these people live. For years physicians have been trying without avail to get Congress to pass a law providing for the condemnation of unsanitary houses.¹ There are large numbers of frame shacks down on the ground, without any ventilation under the floors, without water in the houses, and without sewer connections. These buildings are hidden away in the centres of the squares, and people living on the main streets are often unconscious of the fact that there is such a population on these interior alleys. That is where the "lung blocks" are. During the winter of 1904-05 the physicians of Washington had a very satisfactory bill passed through the House, which, on going to the Senate, was referred to a committee the chairman of which was, unfortunately, "down on the health officer." The result was that practically nothing was accomplished.

As regards other countries than our own, Hillier presents this map (Fig. 28), which demonstrates that in Europe, Great Britain, Norway, and Belgium have the lowest phthisis mortality; then follow Italy, the Netherlands, Denmark, Ireland, Switzerland, Germany, Sweden, France, and lastly, Hungary, Austria, and Russia. Concerning Germany, however, we must observe that although the tuberculosis death-rate is, as a whole, still somewhat high, it has been steadily declining in Prussia since 1886, and is now about the same as in Great Britain.

In Fig. 29, moreover, will be seen the mortality in fourteen large towns of over half a million inhabitants. Evidently the phthisis mortality is highest in Moscow, St. Petersburg, and Vienna, and lowest in Amsterdam, London, Naples, and Buenos Ayres.

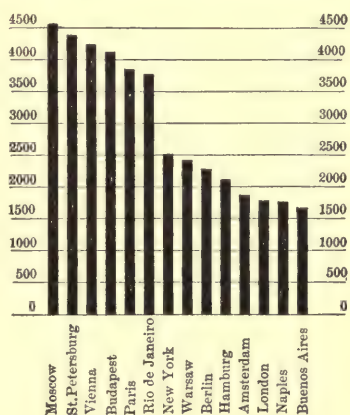


FIG. 29.—Mortality from tuberculosis of the lungs in cities of the world with more than 500,000 inhabitants per million living. (Koehler-Hillier.)

¹ Sternberg.

CHAPTER IV

OCCUPATIONS

The consumptive is far more a source of danger to his fellow-workingmen than to his family, especially if his calling be within doors.—CORNET.

SOME preliminary observations are essential before considering occupations in detail. Of first importance, of course, are physical conditions,—the physique of the workingman. Then there are the low wages in some callings, because of which physical needs—food, fresh air, and the like—cannot be adequately satisfied. Next come family tendencies concerning occupations. This obtains in other countries more than our own. In England, a bricklayer, for instance, has been for generations of a bricklaying family, with no aspirations for anything else than to lay bricks. Among us the son of a bricklayer may not be content until he has become a politician, a poet, a philanthropist, or a physician—poor fellow!

Then there is a process of natural selection with regard to occupation, some men by nature and physical endowments tending to farming; others of sedentary habits to book-keeping; others by reason of mental and moral tendencies, allied with enervated physique, to bartending, or hotel service. Then there are in individual cases long periods of decline in strength of body and mind when a man successively drops from a good job to one not quite so good; so that from grade to grade he finally reaches the ranks of the unemployed. There is no little pathos in the popular impression that after forty a laborer is “a dead one.” Then some men are steady workers; others are intermittently employed.

Among the pregnant observations of Mr. Easton, whose work is noted in the next chapter, are the following: Many workingmen take up a poorer grade of work on becoming ill,—a commercial traveller may take to peddling cheap pictures in his old age; a compositor has become a lamplighter; a gardener has taken to making beds; a skilled mechanic to loading trucks. And a pathetic feature of such cases is that oftentimes such an unfortunate man will be cut by his former associates on account of his industrial decline,—like healthy animals who push aside and appropriate the food for which their sickly fellows have not the strength to fight.

Very important is it to consider the conditions of life outside the working hours; here the workingman's social stratum is important. For instance, the very poor man goes in the evening to a squalid home and eats food cooked outrageously in a frying-pan. It has been said (I make no doubt of it) that many a poor man is driven to drink by the dreadful things which his wife has prepared for him to eat. An experienced nurse¹ reports as follows: "What is the particular factor in the home life which predisposes more than any other to this disease? The nurses almost invariably answer, 'Poor food, poor in quality, in quantity, and, worse still, the way in which it is cooked.'"

Cornet notes from the records of a number of Berlin mutual aid associations that there is among engravers a mortality from tuberculosis of 40 per cent., among waiters 45 per cent., painters 47 per cent., polishers 54 per cent., bookbinders 63 per cent., cabinet and piano-makers 55 per cent., upholsterers 61.5 per cent. It is quite certain that in factories where there are no cuspidors, and where careless and uncleanly consumptive workingmen spit on the floor, so that the sputum is swept up in the dust, the danger of infection is greater. And the dissemination of sputum may occur in other ways, as by emptying cases of mull or in beating carpets and cloths. In many cases it is difficult to determine the sources of infection.

The City of Munich presented at the Dresden Exposition of 1903 an analysis of its cases of tuberculosis on the basis of occupation. The greatest number of cases came from the classes described as workers in dust, and of these, especially those in metal dust. Next came the workers of wood, such as carpenters; then the manufacturers of clothing; while the fisherfolk and farmers are apparently hardly represented. We shall see that these data correspond fairly well with others.

In Fig. 30, for which I am indebted to Miss Brandt, fifty-three occupations are specifically considered. The consumptive death-rate of marble and stone-cutters is shown to be six times that of bankers, brokers, and officials of companies,—an excellent reason, among others, why one should cast his lot among the latter fraternity, if possible. The high mortality among marble and stone-cutters is undoubtedly due to irritation of the respiratory tract by remote inhaled particles of stone. The high mortality among cigarmakers is due largely to the irritating effects of tobacco upon mucous membranes; but the bad air and the wretchedly unsanitary condition under which these people work, both in factories and in their homes, are essential factors. Cabi-

¹ New York Medical News, Oct. 24, 1903.

netmakers and upholsterers breathe in dirt, while plasterers, white-washers, and the like inhale in addition cement and other injurious substances.

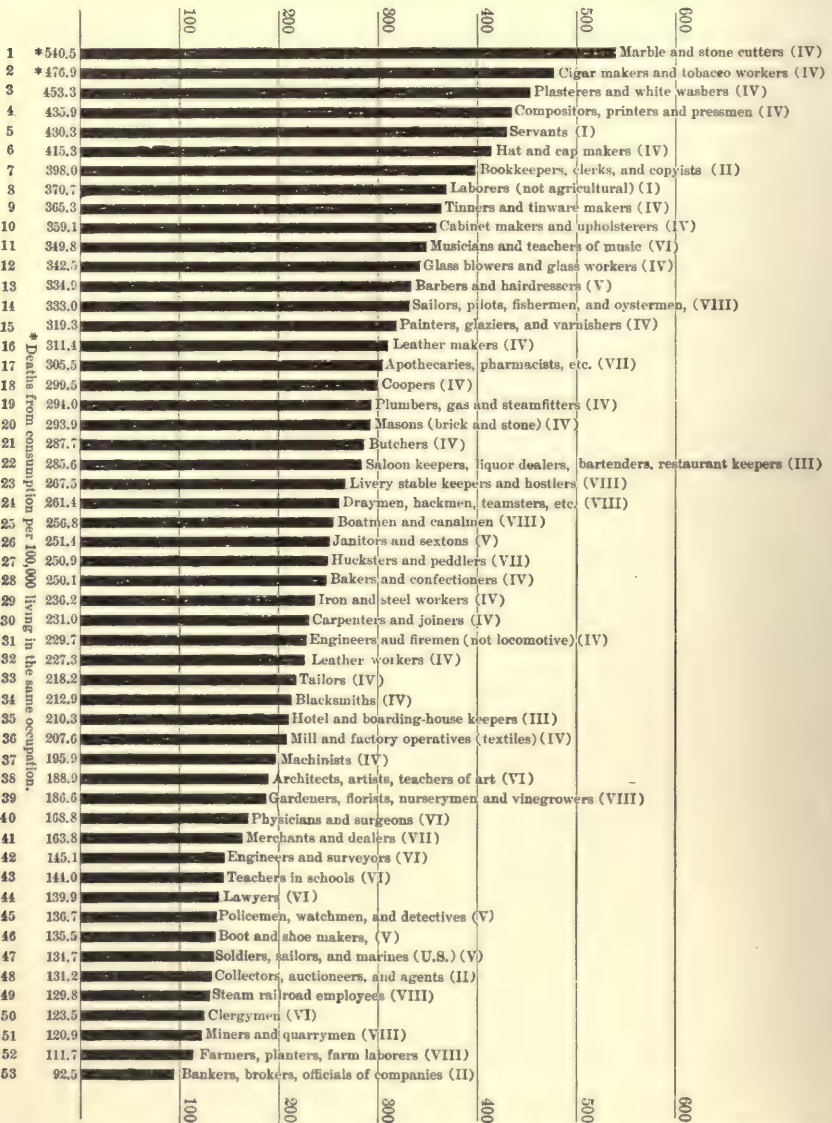


FIG. 30.—Death-rate from consumption, of men in fifty-three occupations, in the registration States of the United States—1900. (Brandt.)

As regards musicians, all of the artist callings are in Miss Brandt's classification included in this occupation,—the orchestra conductor, as well as those who play in theatres, dance halls, restaurants, upon the

streets, and the like. Many of these most lovable people lead irregular Bohemian lives, having no thought for the morrow. During periods of poverty they become enervated from exposure and lack of food.

Draymen and teamsters work in the open air; so it would seem they should not be very tuberculous. But they lift tremendous loads. They carry cases on their backs, such as ordinary men are barely able to turn on end. They drink heavily, moreover, as is also the case with hackmen, hucksters and peddlers. In all these occupations the hours are long and irregular, and there is much exposure. Janitors live mostly in unsanitary basements.

Saloon-keepers, hotel servants and bartenders show a heavy mortality. They are, by their physical and moral make-up, unfitted for any other occupation. Besides, saloons are dark, dank, dirty and bacillus-laden. In this table they are classed with restaurant-keepers, otherwise their mortality surely would be much higher.

Hat and cap-makers work in overcrowded, ill-ventilated apartments. Their hours are long, and their wages are said to be very low; besides, injurious dust and dyes are used in these trades. The tailors and the garmentmakers, however, have a death-rate which would be surprisingly low were it not for the fact that Jews, who, as a race, certainly enjoy a comparative immunity to tuberculosis, monopolize these trades.

Glass-blowers show the influence of exposure to extreme heat; they are apt also to sit for many hours in constrained positions.

The laboring class (the non-agricultural) is very large, and is made up of many elements. Its members work irregularly at tremendously exhausting labor. There is among them much intemperance. Their food is badly cooked at home, and many of them bring from Europe constitutions weakened by a struggle with hard times there; and they live in the cheapest of lodging-houses or the worst of tenements.

It will be noted that occupations with a high mortality are conducted generally in cities and large manufacturing towns, while those having a low tuberculosis death-rate are almost all carried on in small towns or in rural districts.

It seems odd that miners and quarrymen should occupy a position so low in the list; for their work is exhausting. It would be presumed that they inhale much coal and other dust. Various explanations are given for this. Brandt observes that there is a very high death-rate among quarries in England, and that among miners the rates vary enormously, with the kind of material mined and with the locality. The statistics show very high rates for tin, copper, and lead-miners, while coal-miners show varying rates in different coal

fields, but all low. The slight susceptibility of coal-miners is attributable in a measure to their being a picked class of men, the work precluding the entrance of any one not of a physique above the average.

Cornet attributes this comparative infrequency of pulmonary tuberculosis among coal-miners to the fact that the amount of moisture in the subterranean atmosphere of the mines approaches the saturation point and renders the desiccation and dissemination of sputum impossible. No doubt this has much to do with the matter. Possibly also the coal-dust possesses a slight disinfecting power.

Dr. Oliver, of Newcastle-on-Tyne, England, has produced an excellent paper on the gold-mines of South Africa, in which he reports a very high death-rate of 70 per 1000 among white rock-drill miners of the average age of thirty-five, as against the mortality among English miners in coal of 6.3 per 1000; in ironstone of 6 per 1000; in tin of 8.1 per 1,000. He considered that this very great difference in the mortality rates was probably due to the insufficient precautions taken in the Transvaal mines to prevent the scattering of dust, and therefore recommended that dry mining should be converted into wet mining by means of jets and sprays. Here Oliver coincides with Cornet.

It is interesting in this connection to note an editorial in the *Iron Age* upon the Water Drill as a Preventive of Miners' Phthisis. It is here again recognized that one important cause of the great prevalence of this disease in the South African mines is the presence in them of large quantities of dust, and that the remedy is to remove this dust as far as may be. The Transvaal Chamber of Mines in October, 1903, invited a submission of methods to lessen this evil. Among many suggestions two were valuable,—one a water drill, the other an atomizer. The Leyner drill seems the best means of laying the dust, doing so at the very point where the dust is generated. One atomizer submitted by T. J. Britten was found to lay 75 per cent. of the dust in the level where it was tested, and possessed the additional advantage of laying the nitrous fumes generated in the blasting. This process, however, involves the use of a separate machine, whereas the water drill is a part of a regular mining instrument. On this account the latter is likely to be preferred in practical mining.

W. O. Eastwood, Esq., of Whitby, Ontario, comments upon a form of tuberculosis popularly known as "knife-grinder's rot," which prevailed some time ago to a much greater extent than it does nowadays. It affected chiefly those engaged in grinding on the dry stone. It was recognized as the wellnigh unavoidable fate of those who were

tempted by the high wages to undertake this work. Latterly, however, some kind of an exhaust or blower was devised that carried or drove the grit and small particles of steel in such a direction that the workmen no longer inhaled them; and, thereafter, a deadly tendency became practically eliminated from this occupation. From a medical work published fifty years ago, Mr. Eastwood quotes: "The fork-grinders of Sheffield, who grind dry, died from twenty-eight to thirty-two years of age; razor-grinders, who grind both wet and dry, died from forty to forty-five years of age, while table-knife grinders, who work on wet stones, lived to between forty and fifty years."

Street-sweepers do not seem to be particularly prone to tuberculosis. Flick and others declare such to be the case. It seemed at one time that many among the New York City street-sweepers were tuberculous, all the more because the streets of this city are not sprinkled nearly as much as upon general principles they should be—not nearly as much as continental cities. New York is an extremely dusty city, and Street-Cleaning Commissioner Woodbury, assisted by the health department, instituted an investigation. Out of a total of 1872 men, 283 were found to have pulmonary affections. Of this number, 60 were tuberculous—rather a small proportion among nearly 2000 men. And this proportion is measurably accounted for by the fact that the sunshine and pure air, rain and other water out of doors, kill the micro-organisms.

In the excellent book entitled "Dangerous Trades," the following occupations are enumerated as being more than others conducive to tuberculosis:

Potters,	Printers,
Dusty occupations,	Hatters,
Earthware-makers,	Tailors,
Cotton operatives,	Drapers,
Locksmiths,	Shoemakers,
Bakers,	Miners,
Blacksmiths,	Soldiers,
Coopers,	Sailors,
Woodturners,	Gardeners,
Rope-makers,	Porcelain- and cement-makers,
Bricklayers,	Masons,
Carpet manufacturers,	Typographers,
Tin-workers,	Mother-of-pearl grinders,
Cutlers,	Lead-miners,
File-cutters,	India-rubber makers,
Glass-makers,	Millers,
Copper-workers,	Brewers,
Gunsmiths,	Carpenters,

Zinc-, iron-, and steel-workers,
Stone-quarriers,
Gold-workers,
Brass-workers,
Chimney-sweeps,
Wool-workers,
Textile-workers,
Bookbinders,

Chemical- and flax-workers,
Laundresses,
Boiler-makers,
Ship-builders,
Upholsterers,
Railwaymen,
Publicans,
Coal heavers and trimmers.

In practical confirmation of much that we have noted concerning occupations is the plate of Mr. Hoffman, from which it appears that consumption causes the highest death-rate among stone-workers, printers, glass-workers, brass-workers, book-keepers, plumbers, sales-



FIG. 31.—Consumption death-rate among workmen. (Hoffman.)

men, hatters, silk-workers, and cigar-makers. In all of these occupations over 33 per cent. of all deaths were due to consumption. Between the ages of twenty-five and thirty-five the proportion was over one-half among stone-workers (64 per cent.), glass-workers (58.7), hatters, book-keepers, and printers.

With regard to the occupation of the soldier, Cornet quotes Schmidt: "The civil population was everywhere better off than the army with respect to mortality from tuberculosis," so that it would

not seem that this disease was generally introduced among the military by the civilian recruits. The greater frequency of tuberculosis among the soldier class was ascribed to the excessive exertions and hardships of the service, to carrying knapsacks, to insufficient nourishment, to a completely altered mode of living, and to homesickness. Cornet, however, from a consideration of conditions in the Prussian, Bavarian, Austro-Hungarian, and Belgian armies, reached other conclusions,—that a number of tuberculous individuals enter the army, and that the military service, as such, in spite of the greatly increased demands on the physique, cannot be held primarily responsible for its occurrence. In fact, the decrease in the number of those taken sick during the second year of service, which becomes still more marked in the third year, almost seems to indicate that the same age and class in the army enjoys a greater immunity from infection than the corresponding class of civilians. This protection is not absolute, for cases of infection undoubtedly occur in the army, especially when the hygiene of the barracks is faulty. Formerly, when barracks life was equivalent to crowded living and uncleanness, infection probably occurred very often, and it may still do so in some armies. It is possible also that the quartering of soldiers on citizens during manœuvres furnishes much chance of infection. But there is a compensating factor in the extended stay of the soldiers in the open air which does not obtain among civilians of the same age. A causal relationship between tuberculosis in the armies and the so-called ill effects of military service, over-exertion, etc., cannot be supported.

For much the same reasons, therefore, Cornet considers that consumption does not become more prevalent during wars, in spite of the fact that soldiers are exposed to great bodily hardships, to cold and wet bivouacs, to insufficient nourishment, and to sudden climatic changes.

CHAPTER V

HABITS AND SOCIAL CUSTOMS

The consumptive himself is almost harmless, and only becomes harmful through bad habits.—CORNET.

THE establishment of the Tuberculosis Infirmary on Blackwell's Island is described in an interesting paper by Homer Folks, Esq., Commissioner of Charities for New York City in 1902. Mr. Folks found himself "in some uncertainty as to the value of the institution." Many patients were discharged otherwise than as improved, and the nurses and physicians seemed to have no clear idea why the roll of inmates changed so rapidly. In order to get some knowledge as to just how much was being accomplished for the patients while in the Infirmary, and for a better insight into the actual workings of the institution from the patient's point of view, Mr. Christopher Easton was appointed Deputy Superintendent with instructions to give special attention to personal acquaintance with the patients, to the social life of the institution, and to its economic and social features. This gentleman, a Princeton graduate, had no previous experience in institutional or hospital work. He was instructed to become personally acquainted with each patient immediately upon admission, and to secure from him such information as might, when added to hundreds of similar histories, throw light on the general question of the treatment of the tuberculosis problem by municipal and private means. He was to explain to each patient the objects of the institution, how to adjust himself to the life within it, how to get the most benefit from it, and how to exercise the greatest precautions in his own behalf and in behalf of the other patients. He was to explain the printed rules and to encourage reports to him any matter about which there seemed to be reasonable cause for complaint. He was to investigate carefully each such complaint, and to see that substantial justice was secured. He was to interview every patient discharged, either at his own request or because of insubordination or misconduct, or as apparently cured, and was to keep full records showing why he left the institution, and his condition on leaving as compared with that on admission. He was also to keep in touch as well as he could, by correspondence, with patients discharged as improved and apparently cured. He was given direct and special oversight of the sanitary discipline of the institution, the daily life of the patients, their recrea-

tion, games, exercises (under the direction of the physicians), reading, and entertainments. An elaborate schedule of questions concerning personal history, family relations, history of disease, etc., was followed;¹ and the patients seemed, as a rule, willing and glad to give the desired information.

It seemed to Mr. Easton that hopefulness and good cheer are the general tone of this institution, which one might expect to be the least cheerful in the Charities Department. His statistics cover only one hundred cases, too small a number to have any considerable value. However, taken in connection with similar statistics in other institutions, or with the larger number accruing from a continuance of his labors, they should be invaluable in indicating the social conditions and factors which are prominent causes of tuberculosis.

It was found that the average duration of the disease before the patient's admission was seven months and twenty-one days; the average period of unsteady employment three and one-third years. The latter figure is much larger than it would otherwise be by reason of the large number who had been unsteady workers, owing to dissipation or some other cause than consumption. The duration of the disease above given prior to admission is, on the other hand, probably too short. Many patients have not realized their condition in the early stages of the disease. The corresponding period of the patients admitted to the State Sanatorium, Rutland, Mass., is stated as twelve and one-quarter months, although they receive a more incipient class of patients than the Blackwell's Island Infirmary.

Almost exactly one-half of the patients were between the ages of thirty and forty-five; forty-one per cent. were native born, and fifty-nine per cent. foreign born. The birth-place of the mothers showed only twelve per cent. native born, and eighty-eight per cent. foreign born; among the latter, exactly half (forty-four) were from Ireland.

The following data indicate a very wide range of conditions:

Professional, 2 per cent.; commercial, 9 per cent.; mechanics, 21 per cent.; trades, 22 per cent.; unskilled, 46 per cent.

Average length of time which patient has not worked at all before coming to this hospital, 2 months, 14 days.

Average period of unsteady employment before stopping work entirely, 3 years, 4 months.

Number of patients in the condition of whose employment nothing unhealthful was revealed	22
Number who have taken up a poorer grade of work than their main occupation at time consumption appeared or after becoming ill with consumption . .	27

¹ Appendix G.

Number who have maintained the same grade of work after becoming ill with consumption, but followed it unsteadily	12
Number who were doing nothing at time consumption appeared	3
Number who did not work after becoming ill with consumption	26

With regard to recreations of the patients, where they spent their evenings and their Sundays, this tabulation was arranged.

	General Recreation.	Evenings.	Sunday.
Home	—	45	41
Reading home	18	13	11
Reading-rooms	14	6	2
Baseball	2	—	1
Theatre	23	7	2
Walking	20	16	17
Club-room	7	3	3
Visiting	7	5	7
Saloon	41	41	19
Excursions	12	1	9
(Four of them to Coney Island.)			
Church	5	1	5
Smoking	3	2	2
Park	2	1	2
Mission	2	1	2
Fishing	1	—	1
Music	1	1	1
On docks	1	1	1
Cards	3	1	—
On streets	7	7	2
Pool-room	5	2	5
Billiards	1	1	—
Y. M. C. A.	1	1	—
Lectures	1	—	—
Disorderly houses	1	1	—
Dancing	2	2	¹ 15
No time	6	8	² 4

Mr. Easton's comments on this table are :

“The information as to recreation, or lack of recreation, was taken almost verbatim from the patients. For example, undoubtedly more than forty-five spent their evenings home, but only forty-five gave home in answer to the question where they spent their evenings. Home, of course, means where they slept. It might mean a kitchen, or a fore-castle, or a stable, or a lodging-house. It will be noticed that the nine chief forms of recreation, arranged in order of their popularity, begin with the saloon and end with the church. The small number

¹ Working. ² Sleeping.

giving theatre in the evening, although it is third in popularity, is explained by the fact that most of them give it under the question on amusement. Walking, reading, and visiting are relatively more popular in the evening and on Sunday than in general. This is explained by the fact that they are usually given more than once by the same person, while rank in popularity depends on the number of different persons giving a certain amusement. The saloon is the most popular, both to persons patronizing it, and as a way of spending the evening and Sunday. With regard to drink, of these one hundred patients two said they were total abstainers, eleven that they were occasional drinkers, forty-three that they were moderate, and forty-four that they were hard drinkers." Among interesting personal items are the following :

A man had been a cloak-designer in Germany. Of two and one-half years in the United States, he had been ill two years. He found methods of trade different here, and had to take anything he could get. He was first waiter in a good place, and then extra waiter. Finally, his voice got so weak he couldn't even get an extra waiter's job. A well-educated man.

A man did restaurant work in a damp, dirty basement in Bleecker Street. There were thirty in the room where he slept, two of them consumptives. The cots were in two tiers. The food—weak soup and bread—"had no nourishment." The floor was not scrubbed during the four months he was there. The place was run by a religious charitable association; "they had men working in a filthy, damp subcellar."

A patient who had alternated iceman and kitchenman for several years, the former involving getting overclothes wet, the latter all kinds of bad conditions.

A patient who had worked in bakeries two and one-half years after becoming consumptive. He worked with a careless consumptive in one bakery for three years.

A patient who stated that three girls went out with consumption from the laundry where he worked. One man told him that seven men with consumption had left the machine-shop where he worked the year before becoming ill.

A railway porter who became infected from consumptive travellers in sleeping-cars, on their way to health resorts.

A patient had been covering furniture from house to house for seven months. He had felt very weak and would do a quarter of a day's work and then rest for the remainder of the day. He had had no treatment.

CHAPTER VI

THE "LUNGER" IN THE WEST

It is madness to come to California in search of health without ample means to supply all the comforts and luxuries.—EDWARDS.

DR. EARL S. BULLOCK, formerly of New York, now of Silver City, New Mexico, having become consumptive, was sent West by his physician. He recently revisited for a brief season his old home when his confrères heard from him a very illuminating paper on Six Years' Experience with Tuberculosis in the West, from which the following paragraphs are taken. The reader will appreciate my quotation marks: for Dr. Bullock has literary vision; and he can create atmosphere; and he has temperament, as I realized in meeting him and grasping his genial hand:

"I have had personal experience in all the following health resorts, a good deal in some and little in others: Denver, Colorado Springs, Fort Collins, and Pueblo, in Colorado; Raton, Las Vegas, Santa Fé, Albuquerque, Deming, Fort Bayard, Las Cruces, and Silver City, in New Mexico; Phœnix and Tucson, in Arizona, and El Paso, in Texas.

"Resorts for consumptives all have much in common, though they may differ widely in details. Some, though few, are well-built towns and cities, though most, from an Eastern point of view, are miserable places of habitation. Everywhere is the ubiquitous consumptive spitting promiscuously, and the fact that there are so few cases of local infection speaks most forcibly for the truly wonderful healthfulness of the arid region. In few places is the consumptive really wanted. The doctors may desire his presence, but, as a rule, the people do not. It is a fact though, that money is potent with the health-seeker as with others, and when well supplied with it the invalid gets pretty much what he wishes. There are, of course, a number of excellent places open to invalids, but most of them are very expensive or receive patients so far advanced as to make them objectionable to the average health-seeker. What I particularly mean to imply is, that the invalid finds great difficulty in placing himself under anything like as good conditions as he would enjoy at home for an equal expense. As a rule, there seems to be but one compensation in having a consumptive about, and that is to get all possible out of him. It has often seemed to me that the consumptive is managed for the benefit of the people where he goes rather than in his own interest, though in justice I must

say that there is hardly a county hospital in the West that does not have its quota of Eastern invalids, and I have never heard any objection, every one seeming to accept the burden of supporting the citizens of other States as a matter of course. A great many poor people go West for health's sake, and many of them become actual burdens to the communities to which they go. So, to take every possible advantage of the moneyed invalid may work out fairly in the long run, though it seems rather a hard practice to be gracefully accepted by the individual.

"Everywhere one is impressed by the fact that the invalids are usually doing what they ought not to do. They are essentially idle folk and prone to follow the ways of the idle. They always find the centre of population, and, gathering together, support the adage that 'like seeks like.' Nothing can be more pathetic than to see the poor creatures sitting about the plazas, spitting and talking. To an observer picking his way carefully between expectorations, sometimes a difficult thing to do, and making the circuit of the square, the occupants of the crowded benches seldom or never show among them a happy, contented face. Standing about the hotels, watching the trains or the roulette wheel in the corner saloon, sometimes risking a little money themselves, they are always the same pathetic victims of the scourge of civilized States. Hunting, riding horseback, or taking tiresome walks, they are seemingly constantly violating every principle laid down by the immortal Brehmer. One exclaims: Poor old climate, what a lot you are expected to do! Now and then, fortunately, may be seen a porch or tent fitted up for out-door life. Everything is comfortably and tastefully arranged. The invalid, occupying his cot or chair, is reading, maybe, and it is recognized at once that here is a properly managed case, and inquiry will elicit the fact that a careful physician in the East has sent the patient to some careful physician in the West. Such a patient is a very great contrast to those previously described. The daily life is purposeful and filled with little duties, from egg-nog to massage, all tending to make a useful citizen again. The patient may lie on his cot nearly all day, yet he is not idle. On the contrary, he is very busy getting well. A wistful, homesick, discontented expression will be absent in such a case. The fact remains that most people are sent West in an utterly irresponsible way and, if they come under medical care at all, it is usually delayed until every chance of recovery is past. It seems so simple to send patients to some one who is known to be capable of managing them properly, that it is difficult or impossible to condone this careless way of shipping people to a strange land to shift for themselves under new condi-

tions and surroundings. As in nearly every case a doctor has suggested the advisability of going West, the responsibility for this state of affairs rests squarely upon the shoulders of our profession.

“One of the first lessons I drew from my experience was that most people who go West for their health are disappointed in the result, partly for reasons which I have endeavored to make clear, and partly because more is expected of the climate than it can possibly perform under any conditions. The majority of the tuberculous invalids that are observed have long since passed the point at which they would be favorable cases for admission to the large institutions in the East, and it does seem absurd that cases deemed hopeless at home should at once be regarded as hopeful because they have been sent West. I am, moreover, convinced that during recent years we have overestimated the curability of tuberculosis, even under the most favorable conditions in a favorable climate, and, furthermore, that there is a great tendency to underestimate the length of time required to effect a cure. During the first eight months of my own invalidism I was a model patient, and laid the foundation for a subsequent recovery, which, however, was not achieved until four years had passed, although mine was an incipient case of the best or afebrile type. I was thus impressed with the fact that to get well at all is a large contract to fill, and requires a much greater expenditure of time than is ordinarily allotted to it. Cases are so variable and the constitutional equation upon which so much depends is so little known that it is never more than guessing to put a time limit upon tuberculosis. I have several instances in mind in which patients were sent West five or ten years ago to get well in six months and they are still coughing. The Lord only knows how many are dead who were assured of an early and brilliant recovery!

“An interesting class of patients observed is exemplified by the person with ample means and the invalid habit. Though recovery has occurred, possibly years before, a certain delicacy of constitution and long-established custom have impelled a conviction that idleness is the only business compatible with living. With some this becomes a fixed idea which drives them South for the winter and North for the summer, *ad infinitum*. For my part, I cannot understand what good it does to get well when it requires the energies of a lifetime to keep well. Then there is the invalid with the climate habit. He is always interested in the place in which he does not happen to be. I knew one poor chap, visiting thirty-seven towns in two years, who followed that *ignis fatuus*, the proper climate for his case. When failure is progressive and the end is near, it is indeed sad to see such as he race

from town to town, each journey bringing him a little nearer the final stopping-place. This, too, is often the fault of a doctor who lacks the courage frankly to advise a return home, and yet will hold out a false hope in order to rid himself of a dying patient.

"During even a few years' experience one comes in touch with a number of old chronic cases in which hope of recovery has long since been abandoned. Yet many of the people thus doomed lead very useful lives, and unquestionably live longer in our beautiful climate under the more natural conditions thus possible than they would had they remained East. Once in a while a man will be observed who has recovered while roughing it. But where one gets well in this way many discover that it will not do, though often the knowledge costs more than can be paid. Fewer people than formerly have the idea that large quantities of whiskey must be consumed in order to make a recovery. There are still enough, however, to demonstrate the real character of this rather agreeable method of committing suicide."

Frank D. Witherbee, Esq., describes the great migration of tuberculosis patients to the Salt River Valley of Arizona, and of the life they lead in tents and shacks in and about Phœnix. Out of a winter population of some fifteen thousand, fully one-third are health-seekers, drawn to Arizona by the dry climate and constant succession of sunny days which are essential for their relief and cure. Fully 90 per cent. of the days in Phœnix are clear and bright, and the relative humidity of the atmosphere is far below that of the average. "On the one hand these conditions lead to a remarkable percentage of recoveries; but on the other there is an amount of social and spiritual suffering which is not generally understood. As a matter of fact, a great majority of people go too late to be helped by any power on earth. A Phœnix physician has said that fully four-fifths of the visitors are incurable. The streets are filled with them,—thin and wretched, homesick and suffering. Heedless physicians and relatives send patients to Phœnix alone and with scant means of support. The blundering argument is made that all the sick one needs is to get to that country and his condition will permit of his doing light work which he can easily find. But the facts are that this incapacitated one is going to a country swarming with people looking for like chances; that it is essentially a ranching community, where the bulk of the workers to be of any service must be able to plow and sow and reap and herd cattle, often standing in water all night long to irrigate. What few chances there are for light work ought not to be accepted because they are too confining. Here, as wherever consumptives have taken up work in desirable climates, they have by their underbidding

and their numbers steadily forced wages down to a point where they can scarcely earn enough to live. Many of the necessities of life, by reason of high freight rates, are much more costly than in other communities. Out on the desert, at the outskirts of the irrigated parts of the valley, and extending to the foothills, there are tents of all sizes and description. Some are in groups and others stand alone; some are roomy and attractive, others are cramped and desolate-looking. Some of the ranchers near Phœnix have made a speciality of providing accommodations for health-seekers, and offer furnished tents or rooms in specially constructed houses with board at the ranch house. The local fraternal lodges, the churches, the county almshouse, and the one free sanatorium are crowded to their utmost capacity year in and year out. Many a patient reaches Phœnix with his small capital exhausted by traveling expenses, and finds himself dependent upon the resources of a community which has no interest in him and where he finds on many sides an almost hardened indifference to his pitiable need. This is not because residents of Phœnix are lacking in the finer feelings which prompt to charitable service, but because the people of the East and Middle West are, by their lack of forethought, putting upon them a burden which in no sense belongs to them. The supervisors say that the poor in the almshouse cost the county \$20,000 a year, and three-quarters of this is spent in the care of ailing consumptives."

All these dreadful conditions will in the course of time be mitigated when it becomes understood that the climate of the West is not essential to recovery from consumption, and that sufferers are quite as likely to get well near their own homes in the East.

Part V

THE HOME

What an amount of pain and distress, of social misery, is due to the fact that families, having lost their support, sink into pauperism, and eventually fall back upon the charity of the community! And aside from the monetary question, what an amount of moral undoing and wrong is visited upon society through the fact that children have been robbed of their mother and of the educative influence of home. Look at the orphan asylums,—how many of their inmates have lost their parents through tuberculosis!

CORNET

CHAPTER I

THE HOUSE

A grave danger to adults and children, mainly the latter, are our bed-rooms. Indeed, my friend Biermer, late professor in Zurich and Breslau, called tuberculosis a bed-room disease. With what right? A baby is at least sixteen hours a day in that narrow, confined, airless, windowless bed-room; a child at least ten or fourteen hours, the greater part of its young life. The air is the reverse of what it should be to protect blood formation, circulation, and digestion. What can be done to improve it to a certain extent? Some window should be open all night and day. If there be none in the bed-room there is one in the adjoining front room, or the kitchen at the rear. Unfortunately not always, for we are still in an era of the selfish refusal on the part of man to be held responsible for the evils and ills of his neighbors. We are hardly entitled to call ourselves a civilized community when fifty thousand families at least, with three to six children each, live each in one light room and one or two small dark holes. In these holes they breed tuberculosis. But it is no consolation to you that they die of it. Before they die they infect their neighbors; and their neighbors, in the capacities of seamstresses, servant girls, laundresses, cooks, and teachers, infect you and your children and your friend's children.—JACOBI.

DR. FLICK emphasizes the importance of the house in the development of tuberculosis. An enclosure of some kind—a hut, a tenement, a factory, or a vehicle—“is the granary of the tubercle bacillus outside of its host.” Here the soil is prepared, the seed is garnered and implanted, the tender shoot reared, the full-grown plant nurtured, matured, and harvested. Obversely to normal, natural growth, this seed thrives in dampness and darkness. In the house tuberculous matter may remain vital for months or years.

Up to within recent times the consumptive, being afflicted with chilliness and a general sense of distress and illness, has sought shelter in some enclosure, being deluded with the idea that the further he could get away from sunshine and pure air, from draughts and the cold, the better were his chances of

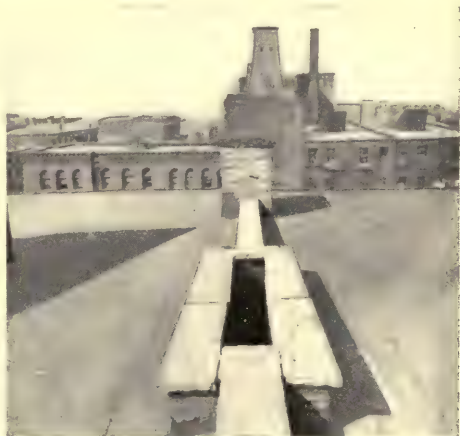


FIG. 32.—An air-shaft 12 inches wide and six floors deep.

recovery. For instance, Michael Peters wrote: "I know nothing more hideously fetid than the bed-chamber of a rich consumptive. It is a spot carefully closed, where both air and hope are alike forbidden to enter. There are sand-bags to doors, sand-bags to windows, thick curtains envelop the bed, where the unfortunate consumptive swelters in perspiration and an atmosphere twenty times respired, twenty times already contaminated by contact with his own diseased lungs."

The recluse and the home-body, under such circumstances as these, easily become a prey. And domestic animals are very prone to tuberculosis. Occasional contact is not dangerous, but intimate, repeated, and much prolonged contact with a person, place, or thing that has been permeated with tubercular matter, is likely to end in

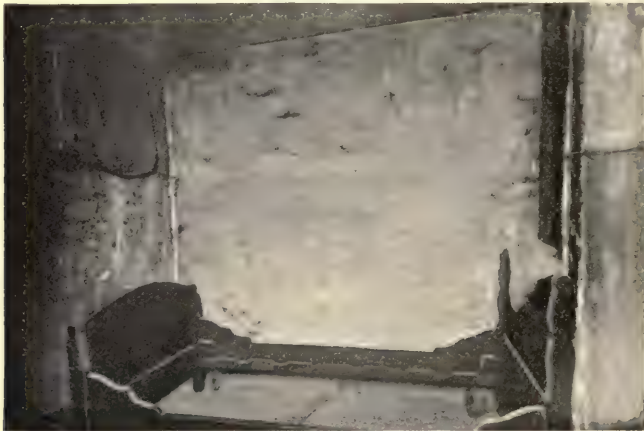


FIG. 33.—There are 361,000 such "dark rooms" in New York City.

tuberculosis. The mere presence of a few bacilli will not occasion this disease. Besides, their virulence differs in intensity. Every one has some resisting power. With every one there is a minimum dose of bacilli, varying according to the individual constitution which will give an implantation. This is facilitated when the organism is subjected to impure air and poor food in dark unventilated rooms. An enclosure is the one place in which contamination can become sufficiently intense to create an environment capable of overcoming the resisting power. Tubercular matter ejected in a house, unless immediately devitalized, dries artificially, and is distributed about in particles, varying in size from weighable quantities to impalpable dust. In these particles the bacillus is cached and preserved. Thus in the course of time quite a great deal of vital tubercular matter accumulates.

The occupancy of such a room means constant inhalation and frequent swallowing of the infective material.

The home and the workshop are the two kinds of enclosure which offer the best environment for implantation. Tuberculosis is a family disease in the main, because it can so easily be implanted around the hearthstone. When once it gets into a family, it follows that family in all directions until it either has exterminated the latter or has exhausted the soil, and made the remaining members immune. The bed-room, and next to the bed-room the dining-room, are the parts of the home most dangerous in this respect. In the bed-room the consumptive spends his last weeks or months,—a period during which the disease is most intensely infectious. Often among the very poor the dining-room is used as the only living place for the sick one until shortly before his death.

The work-shop is a very common means of spreading tuberculosis. Cornet considers it the most common of all. These buildings are often crowded. There is likely to be air-space inadequate for the number of employees. In some trades the air may become charged with irritating vapors or particles. Noxious dirt may be introduced upon the shoes of employees. Sometimes workmen are suffering from germ diseases which do not incapacitate them, but which lower their vitality and invite tuberculosis. Usually the workman "lives in a house which has been built for money-making, about the sanitary condition of which he has practically nothing to say. He cannot select his place of abode, because it is necessary for him to be near his work. He has no voice in the sanitary construction or management of his workshop. It is true he can work there or not as he pleases, but if he wants to earn bread for himself and for his family he must work there or in a place like it."

Tuberculosis is an extremely chronic disease, and usually runs a long course even in its infectious stage before its victim is incapacitated. Some consumptives work thus for the greater part of a working lifetime, occasionally having to stop for a few weeks or months for rest and treatment, and again returning to work as soon as they are able. Unfortunately, uncleanly consumptives very easily contaminate the shops in which they work by promiscuous spitting. One consumptive can produce an environment around his own stand capable of implanting the disease in those who are next to him, and before long these are associated with him in the task of polluting the shop. Deaths will occur from such a shop at regular intervals for an indefinite period so long as it is permitted to remain contaminated.

Hotels, churches, public halls, and places of public convenience,

in which people stop for a short time only, are not so dangerous, because a consumptive rarely remains in them long enough to produce an infectious environment; and again, because healthy people seldom remain in them long enough to get an implantation. Cleaners and caretakers of such places are in some danger, but for the casual visitor there is practically none. The house nurtures the tubercular growth when an implantation has taken place. The disease always begins in a very small way. The first crop develops and runs through its course, and the second follows, perhaps a little larger than the first. Then a third and a fourth follow, each a little larger than the preceding one, until finally so much tissue has been invaded and destroyed as to make death inevitable. Things which have been intensely contaminated by having been used for a long time by a consumptive may give the disease to others when kept or used indoors. Dust in the neighborhood of a bed in which a consumptive had died was found six years after the death to contain virulent tubercular bacilli (Cornet).

House-life undoubtedly plays an important role throughout the entire course of tuberculosis to its culmination in consumption and death. With every recurrent crop of tubercle bacilli the organs of the body become more embarrassed and the economy is less apt to carry on the warfare against the disease. In the lungs the air supply grows less with each destruction of lung tissue. Tuberculosis makes its progress generally because its victim is shut up in a house where he cannot get fresh air. In the houses of the poor an ample supply of fresh air is impossible.

Osler has had his outpatients in Baltimore visited in their homes by intelligent women with a view to noting the conditions in which they live. These visitors reported bad sanitary location in 62 per cent. among Russian Jews, 53 per cent. among negroes, and 16 per cent. among whites. There was overcrowding in 61, 41, and 32 per cent. respectively; personal and household uncleanness in 70, 56, and 30 per cent. respectively.

European observers conclude that the large mortality from tuberculosis, especially among the poor, is to be attributed largely to the crowding of tuberculous cases in certain houses. Therefore, they consider quite rightly the fight against tuberculosis is especially to be carried on in the dwellings of the very poor.

CHAPTER II

POVERTY

It is hard for men to make headway when their virtues and energies are cramped by poverty.—JUVENAL.

The poverty of Lazarus makes itself felt in the house of Dives.—S. SOLIS COHEN.

POVERTY, with all that the word implies—underfeeding, deficiency of sunlight, defective ventilation, overcrowding, uncleanliness, and bad drainage (which induces damp walls in houses)—stands enormously in a causative relation to tuberculosis. Biggs¹ has graphically demonstrated this by means of maps of various sections of New York City. Bulstrode submits the death-rate from pulmonary tuberculosis in Hamburg among the several income tax classes (inclusive of the dependents of taxpayers). For incomes from nine to twelve hundred marks the death-rate is 55.4; for incomes of from twenty-five to fifty thousand marks the death-rate is 7.5; a proportion against the poorer classes of nearly eight to one.

Körosi, of Budapest, found that consumption caused over 22 per cent. of all deaths among the poor, but only 16 per cent. among the well-to-do. London statistics show that the consumption death-rate varies according to the number of persons to a room. In Dundee it has been found that it varies inversely as the number of rooms in an apartment. In France, states Lagneau, the consumption mortality varies directly according to the size of the city from 490 deaths per 100,000, living in Paris, to 181 in the ninety-five cities of less than 5,000 inhabitants.

In American cities of 8,000 and over in the registration area, the mortality from consumption was 53 per cent. higher than in the rural districts. The towns of 25,000 inhabitants or more in New York State have a death-rate from this disease not far from twice as great as the rest of the State.

In Miss Brandt's table it is shown that cities with a population of over half a million have the highest mortality, both from all causes and from consumption. This is explained on the basis that in these cities "slum" conditions, such as are ideal for the propagation of consumption, exist at their worst. The striking thing here is that the thirty-seven cities between 50,000 and 100,000 inhabitants, though

¹ See Page 147.

coming fourth on the list, rank second as regards consumption mortality, having both a general death-rate and a consumption death-rate close to those of the six great cities. Possibly these figures mean that in the United States cities are generally allowed to attain a considerable size before the public realizes the housing, the drainage, the water and milk supply, the street cleaning and other problems that have

DEATH-RATES IN THE 340 REGISTRATION CITIES OF THE UNITED STATES, CLASSIFIED ACCORDING TO SIZE. (BRANDT.)

Number of Cities.	SIZE.	Population of the Group.	NUMBER OF DEATHS		DEATH-RATES PER 10,000 POPULATION		Percentage of all Deaths due to Consumption.	Rank according to Consumption Death-Rate.
			From all Causes.	From Consumption.	From all Causes.	From Consumption.		
6	500,000 inhabitants and over.	8,074,561	157,494	18,036	191.5	22.3	11.45	1
13	200,000-500,000 inhabitants...	3,721,248	70,930	7,698	190.6	20.7	10.85	3
19	100,000-200,000 " ...	2,412,538	40,538	4,566	168.0	18.9	11.26	4
37	50,000-100,000 " ...	2,539,681	48,700	5,571	191.8	21.9	11.44	2
52	25,000- 50,000 " ...	1,903,222	30,960	3,129	162.7	16.4	10.01	6
213	8,000- 25,000 " ...	3,073,182	53,737	5,330	174.9	17.3	9.92	5
Total registration area.....		28,807,269	512,669	54,898	178.0	19.1	10.69	

been growing up, and sees its responsibility for them. The prevalence of the bad conditions in the six largest cities would explain their rank, without discrediting the efforts of the municipal government. Perhaps, moreover, the small city between 50,000 and 100,000 is large enough to have its serious sanitary problems, and has not yet realized their gravity.

The various large cities in the United States vary also considerably in their consumption mortality. Between the highest and lowest death-rate in twelve cities there is a difference of almost 150 per cent. To reach a lucid conclusion here we would have to investigate carefully the climatic and sanitary conditions of each city, the composition of its population as to race, sex and age, the industrial situation, and the method of reporting deaths. New Orleans has the highest death-rate, probably because of its large negro element. Next comes San Francisco, probably because of its Chinese population. (Brandt.)

Two practical observations are pertinent. The poor move frequently several times a year. They become discontented, or ill, or they are too poor to pay the rent. If any member of the moving family be consumptive, that apartment and the next, and the others to which they go, will become infected. So that it has been counselled that not only consumptives but also apartments in which

they have lived should be registered, and that the law should require the owners of buildings to make such notifications. Then the poor servants of the well-to-do, if there be consumption in their own homes, are likely to bring the infection into the families of their masters; as are also poor consumptive workmen who are employed upon repairs in the houses of the rich. There is, in fact, no limit to the extent to which the disease may be disseminated from its primal base—the homes of the poor sufferers. For instance, tailoring establishments often put out their work to be done in sweat-shops or in tenements



FIG. 34—Basement of tenement-house in block known as "Lung Block," because of prevalence of tuberculosis. No day-light—gas burning at mid-day. A woman in the last stages of tuberculosis working on fancy collars. [Illustrating Dr. Annie S. Daniel's article on "The Wreck of the Home," *Charities*, April 1, 1905.]

of a most unclean and germ-ridden sort. In such manner does danger lurk for the whole community. Poole¹ states that in a row of fifteen old houses on Cherry Street, in New York, he found thirty-one little children and eighty-seven women sewing on garments. These garments—the kind for sale in clothing stores—were almost all to be worn by young children.

Again: "A man was dying down in the Ghetto. His cough kept on day and night. It was January. Coal was high. The room at night grew freezing cold. The Plague grew worse. He worked

¹No one should fail to read Mr. Poole's paper in the Handbook of the New York Charity Organization Society. And in that volume also, as in the collection of the Hebrew Aid Society, the Children's Aid Society, and other associations, are many pitiful stories illustrating the dreadful tenement conditions in New York City, particularly as illustrating the infectious nature of consumption.

on in bed. He had but one blanket. He used the coats and trousers to cover him. Now consider our tense, rushing, strained city life; remember the scores of your own friends whose vitality is now at the lowest ebb; and then think of the constant danger to them from a plague whose victims keep on working; who are constantly in the streets, the cars, and all public places. We all use the products of their work. Only be human and think of these hundreds of thousands, rich and poor alike, in constant danger. Thousands of these will inevitably be taken with the plague this year, as thousands were taken last year and before."



FIG. 35.—A tenement-house where the occupants work on women's wear.

Wykoff has powerfully characterized these sweat-shop conditions: "While the Unionist was talking to the Sweater, I walked between the close lines of machines over a floor covered deep with accumulations of dirt and shreds of cloth and broken threads to where in a corner a group of girls were sewing. The oldest among them may have been twelve, and the youngest could have been a little over eight, and their wages averaged about seventy-five cents a week for hours that varied widely according to the stress of work.

"Near the corner was a passage, and through it I could see into a small room which had no windows nor any opening but the door;

there, in perpetual darkness, lit up by one oil lamp, was a man who, for twelve (and sometimes fifteen) hours a day, pressed the new-made clothing for a living.

“It was ladies’ cloaks that the sewers were making; of course, they worked by the piece, and the best among them could earn a dollar in the day, and sometimes more by working overtime. They were very smart-looking garments, and their air of jaunty stylishness was a most incongruous intrusion upon their surroundings. When I asked the Unionist for whose trade they were being made, he seemed to think nothing of the fact that he mentioned in answer one of the foremost merchant-citizens of the town.

“We were on the point of leaving when a heavy footfall sounded on the wooden steps and the door opened to the touch of an inspecting officer, whose glowing health and neat, woven uniform were as though a prosperous breeze was sweeping the stagnant room. The work, however, was as unaffected by his coming as it had been by ours. Not a sewer noticed him, and the stitching of machines went racing on with unabated swiftness. Only ‘the old man’ watched nervously the movements of the officer as he walked about the shop, making note of the bad air, and the filth upon the floors, and the group of little girls, and the dark, unventilated chamber beyond.

“The Unionist had caught me by the arm. ‘We’ll wait,’ he said; and we stood together in the shadow of the open door.

“Returning finally to the side of the old Sweater, the officer handed him a printed form.

“‘You must make out this blank,’ he said, ‘and have it ready for me when I call again.’ And without another word he started for the stairs. But on the way some evidence of unsanitary conditions more shocking than any met with yet—a heap of offal on the floor or a fouler gust of poisoned air—checked him, and he turned indignantly to the nearest worker.

“‘Look here,’ I could hear him say, ‘you’ve got to clean up here, and right away. The first thing you know you’ll start a fever that will sweep the city before we can stop it.’

“The young Hebrew had stopped his work and turned half round in his chair until he faced the officer. There were deep lines in his haggard, beardless face, and his wolfish eyes were ablaze with the sense of sharp injustice.

“‘You tell us we’ve got to keep clean,’ he answered, in broken English, lifting his voice to a shout above the clatter of machines. ‘What time have we to keep clean when it’s all we can do to get bread? Don’t talk to us about disease; it’s *bread* we’re after, bread!’

And there sounded in the voice of the boy the cry of the hungry for food, which no man who hears can ever forget.

“The officer passed, speechless, up the steps, and we followed into the clean, pure air, under the boundless blue of smiling skies.”

This rather attractive picture (Fig. 36) is of a room in Philadelphia occupied by a family that had a suggestive history. A daughter contracted consumption. In the place where she was employed at sewing a consumptive girl had sat day by day next her. Soon the mother contracted the disease. The father, a reformed drunkard, came down with it. Then another daughter came to suffer. Then a son, a cooper by trade—a strong man, “able to lift a hogshead”—began to think that consumption must be an infectious disease. And then he came to be fearful for himself. His wages were eighteen dollars a week,—enough to support the family if he remained home, but



FIG. 36.—Six deaths from consumption in this room.

not enough for both him and the family if he should go away. Having thoroughly considered the matter he made up his mind. He stayed with the rest, supported them, became consumptive, and died. The seventh of the family, a child, did not contract pulmonary consumption, but developed instead tuberculous spine. Here the disease claimed six deaths.

Dr. Milliken, of Silver City, New Mexico, narrates that in 1890 a farmer, of good family history as regards his physique, took the Grippe; and, owing to a relapse, was very slow in making a recovery. He spent much of his time during convalescence with a friend who was ill with tuberculosis. He himself contracted consumption, of which he died. His son, a strong, hearty fellow, who nursed him when he became too weak to take care of himself, became consumptive and

died four years later. A second son put into his own room the carpet that had been in his father's room. In about one year he began to decline. His illness was also shown to be tubercular, with which he struggled for seven years, finally achieving a return to good health. Another son bought the couch upon which his father had slept, and used it to sleep upon himself. He soon evidenced tuberculosis, which disease he succeeded in arresting after a five years' struggle. A fourth son and three daughters, who were away from home, at college, remained well.

A young farmer rented the place and moved into the house. Within two years his wife died of consumption, and two children of marasmus,—probably intestinal tuberculosis.

Another young man, with a healthy family, moved into the house, and lost three children within eighteen months of an obscure bowel trouble (probably tubercular); and the father died a few years later of "bronchitis," which was most likely tuberculosis. It was now suspected that the house might have something to do with it. So a thorough cleaning was ordered. The paper was torn from the walls, which, with the woodwork, floors and ceilings, were washed down antiseptically; there was thorough disinfection, since which time not one case of tuberculosis has developed in it.

To conclude this narration of cases: About a year ago the Duchess and her mother called upon me. I had been her doctor from childhood. She was then a salesgirl, quite poor, fourteen years old, and hence not yet quite old enough to be a "saleslady." She belonged at that time to a dramatic society of young church people. A *Celebrated Case* was to be presented on an evening a couple of months later, and she was to be the Duchess in the play. That is why I thereafter addressed her by this title. She never, however, took part in the performance; which was a great pity, for she was of a winsome and sunny nature and would certainly have played the character agreeably. And the reason of it was that she came to me because her knee was swollen and gave her great pain; and she wanted this cured before the night of the performance. It was pathetic the way she looked when I counselled that instead she must go at once to a hospital, where I feared she would have to stay for some time. To the hospital, then, she was taken at once by her mother; and for some time she was beyond my observation in the hands of its excellent surgical staff.

One night some time afterwards I was sent for by her mother to attend the Duchess at her home in a crowded tenement.

"How are you, Duchess? I am very glad to see you," said I, taking her hand.

She greeted me cheerily, but with a most melancholy cheerfulness. For her face was white and very thin, with a clammy sweat upon her cheeks; and her eyes were luminous, almost phosphorescent. Her breathing was labored and hurried—sixty times in a minute; and her heart beat tumultuously with the fever that was in her. I tried to examine her chest; but she sank back most painfully in a paroxysm of coughing.

Then I went away and telephoned to the hospital to learn what had been done. Her tubercular knee had been resected. Then gangrene had set in; and so the leg had to be amputated at a second operation. But the infection had become disseminated and so, after the lapse of a few months, had remanifested itself in the thorax. And then I came back and told her mother how soon I thought it would be when the Duchess would cease radiating a benignant effulgence about her, except in the memories of those, including myself, who loved her. Her mother also became consumptive.

CHAPTER III

ALCOHOLISM

L'alcoôlisme fait le lit de la tuberculose.—LANDOUZY.

ALCOHOL certainly stands in a causative relation to tuberculosis. Pulmonary tuberculosis is almost invariably found in persons dying in the course of chronic alcoholism; tubercle of the peritoneum or pleura frequently accompanies hobnail liver; acute miliary tuberculosis finds alcoholics an easy prey. Kellynack finds 80 per cent. of pulmonary tuberculosis in patients dying of alcoholic neuritis; Osler finds a proportion of eight in eleven under the same circumstances. It is declared that pulmonary tuberculosis is more frequent in heavy drinkers than in people of moderate habits in the proportion of three to one. Lancereaux computes that more than one-half the cases of tuberculosis are due to alcoholism; and this, I believe, has been about the ratio in the medical wards of the City Hospital on Blackwell's Island.

It is difficult to explain the effects of alcohol. Like most of the simplest things in life, no definite agreement has ever been reached concerning its mode of working. Some flippantly consider that it is a preservative for living tissues in the same manner as for anatomical specimens. Prof. Atwater, among others, has demonstrated to the satisfaction of the unbiased mind that alcohol in moderation is a food, and is beneficial and not injurious to the system. Certain it is that there is no hardier stock than in wine-drinking countries. Others hold that chronic alcoholics are more liable to tuberculosis because of the resulting tissue impoverishment.

The bad effects attributed to alcohol lie largely in the state of affairs which it connotes,—unsanitary habits, poverty, lack of nutrition, bad food, ill-ventilated living-rooms, and most of all a condition of the organism exhausted by overwork, in which the reserve force is all that is left to carry on the struggle for existence. Oftentimes alcohol is taken first with a view to keeping a defective economy up to the working-point, perhaps in a tuberculosis subject, or in one in whom all the conditions are receptive to tuberculosis; alcohol is then taken in increasing amounts with the pathetic aim to stimulate the flagging energies, thus making a bad matter worse. Some who contract tuberculosis have occupations conducive to alcoholism, such as

workers in the liquor trade, barmen, waiters and hotel-servants, people who are thus employed because they are from their physical and moral make-up unsuited for another sort of work.

Then again, people who depend upon stimulants take insufficient food. This is the baneful property of stimulants, especially when taken upon empty stomachs. They give a transient sense of sufficiency, and destroy the appetite for food, particularly when, as is so often the case in the homes of the poor, the latter is badly prepared. This is so, not only with alcohol, but with other stimulants as well. Tea is the housewife's dissipation. There are among women many who will tell you that in this drink they find almost their only nourishment.

There is one point about these stimulants which I consider essential to emphasize. Most of them are, as a rule, distasteful in the beginning. I think they are generally taken not because they satisfy a vicious and depraved appetite, but because they satisfy, for the time being at least, a need of the system. Stimulants (wine, tea, coffee, tobacco, and the like) are "paratriptics." They are the savings-banks of the tissues. They tide the needy system over a critical period. They are not always used with vicious intent.

In by-ways one comes upon suggestive experiences. I once was called about dawn of a cold winter morning to see a man in a saloon, who had been taken very sick and was likely to die. There were here in this saloon at this hour a number of men, too numerous to be waited on in the usual way. They did not crowd up to the bar, but formed an orderly line, each man taking his early morning dram as it was served to him.¹ These were men about to go to work,—good, industrious, well-meaning fellows, to all appearances. They were not drinking to satisfy a vicious propensity; they were drinking to prepare themselves as best they could for their day's work. For them alcohol was a food and a necessity, their systems being in the condition to require it.

Deferring for the present further consideration of this phase of the tuberculosis problem, I note in an editorial on Public Houses and the Spread of Tuberculosis that the *London Lancet* considers there is here a fruitful source of infection. It seems that public-house servants are especially prone to consumption. The floors of the poorer

¹ A colleague relates that on Avenue A, in New York City, there is a tippie much in vogue called *Seeley's Best*. A patient stated as a matter of course that he was accustomed to take before breakfast a couple of drinks of this whiskey. The drinks cost ten cents each, and each drink was one pint—a quart before breakfast.

resorts are covered with sawdust, which becomes much impregnated with sputum. This dust is being constantly stirred up by the feet of drinkers. Not only are the servants and the customers thus exposed to infection, but the unfortunate children who are brought by their mothers are likewise in danger. The public house is the poor woman's club, where she can discuss with her neighbors social and domestic incidents. The children cannot be left at home, and so they sit on the public-house floor during their mothers' gossip time. For an instance, several slatternly women were drinking at the counter, while crawling on the floor of the bar and rubbing their hands in the sawdust were two babies from eighteen to twenty-four months old. This is not an uncommon occurrence. No wonder "the race is degenerating or that medical science should have such a hard up-hill fight against disease. Granting that these children, probably the offspring of degenerate beings, become infected with the bacillus. The environment in which they live will necessarily be a potent factor in the development of consumption, and not only will they themselves suffer, but they will also involve the public in great expense for their subsequent treatment and keep."

Walter C. Hamm, Esq., our consul at Hull, England, has presented a most pertinent report upon physical deterioration in that country which "is now making a vigorous effort to remedy the physical deterioration of her working population which has followed from past mistakes. She will succeed, although it will require a generation or two to restore the lost physical stamina. America could also recover from a similar condition, but it will be better if she is warned by the experience of others and avoids the mistakes entirely." It was pointed out during the Boer war that sixty per cent. of the population from which the fighting men of England were drawn lacked the physique to endure the hardships of active military service in the field. A Parliamentary committee of investigation reported that among these causes of deterioration were "overcrowding, pollution of the atmosphere, unhealthful conditions of employment, alcoholism, depletion of rural districts by the exodus of the best types, alleged diminished rate of reproduction among the better classes, bad and insufficient food, and bad conditions attending the life of children." That a very large percentage of the children of the poor in the English cities were underfed was amply demonstrated; in London, for instance, 122,000, or sixteen per cent.; in Manchester, fifteen per cent.¹ Most of these conditions, as regards our own community, have been referred to.

¹ Like statements are made concerning children in American cities.

The Parliamentary commission was obliged to give much of its attention to drink as a cause of degeneration. The evil appeared to be growing among the women of the poorer classes. The children of these women were sometimes born permanently disabled, and after birth were often neglected. There was evidence of a close connection between the craving for drink and bad housing and long hours of work in overheated and ill-ventilated rooms. The desire for a stimulant could not be resisted. Juvenile smoking was found to be another cause of physical debility; it was considered that scarcely two per cent. of stunted men had not been heavy smokers from boyhood. In answer to the question, "What are the chances of a child brought up for the first seven years of its life in a central part of London growing up strong and healthy, enjoying the buoyancy of childhood, and possessing eventually a sound, vigorous constitution?" it was replied, "Very small indeed, except the parents are of exceptionally strong constitution and intelligence." In Finbury, a congested London borough, the death-rate per thousand in one-room tenements was 38.9, in two-room 22.6, in three-room 11.7, and in four-room tenements 5.6.

CHAPTER IV

THE "LUNG BLOCK"

Luft—Luft—giebt mir Luft.—*The Prayer of the Tenement.*

"In a rear tenement a young Roumanian Jew lay dying of consumption. I had come in with a Jewish doctor. With every breath I felt the heavy, foul odor from poverty, ignorance, filth, disease. In this room, ten feet square, six people lay on the floor packed close, rubbing the heavy sleep from tired eyes, and staring at us dumbly. Two small windows gave them air from a noisome court—a pit twenty feet across and five floors deep. The other room was only a closet six feet by seven, with a grated window high up opening on an air-shaft eighteen inches wide. And in that closet four more were sleeping, three on a bed, one in a cradle.

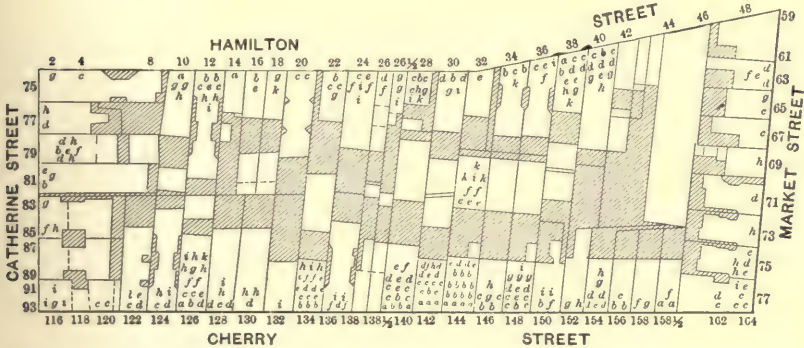


FIG. 37.—Ground-plan of the "Lung Block." The shaded sections are courts and air-shafts. Each letter represents one case of consumption reported to the Health Department since 1894. *a* = one case in 1894. *b* = one case in 1895. *c* = one case in 1896, and so on to *k* = one case in 1903. (As it is not possible from the records to tell whether a given case occurred in the front or rear tenement, all have been assembled in the front building, except in 144 Cherry Street, where there was not room.) In the plans of the Health Department (Part XII, Chapter II) dots (.) take the place of letters.

"'Breath—breath—give me breath.' The man's disease was infectious; and yet for two long weeks he had lain here dying. From his soiled bed he could touch the one table, where the two families ate; the cooking stove was but six feet from him; the cupboard, over his pillow; he could even reach one of the cradles, where his baby girl lay staring, frightened at his strange position. For his wasted body was too feeble to rise; too choked, too tortured, to lie down. His young wife held him up while the sleepers stared silently on, and that Yiddish whisper came over and over again, but now with a new

and more fearful meaning: 'Breath—breath—breath. Or kill me; O, kill me.'

This man, states Poole, was one of nearly half a million immigrants who had come in a single year into our land of the free, and had found that here not even air was free. He had come two years before, young and healthy, with a wife and an infant son. There were now three children in his family. He had from six in the morning until ten or eleven at night only the sweat-shop air to breathe. There are now over fifty thousand in that city alone working as he did. And after sweat-shop work he had gone to sleep in a dark closet six feet by seven. (There are 361,000 such closets in New York City.) In the sweat-shop he worked, infecting the garments he had been sewing and contaminating his fellow-workmen, so that they in their turn suffered and spread the infection.

The lung block, being near the East River, should be wholesome. It will serve as an example. It is in the Seventh Ward, the most congested in the most crowded city of the world. This ward averages four hundred and seventy-eight human beings to an acre. The lung block alone holds nearly four thousand, of whom some four hundred are babies. There are also plenty of animals,—dogs, cats, parrots, and one weazened old monkey. The block is closely packed with huge grimy tenements, which are honeycombed with rooms. Light and air have been slowly shut out to make more rooms. Halls, courts, air-shafts are cramped and deep and sunless.

In observing the map of this block let us note the Market Street end, which is inhabited mostly by Jews, upon whose comparative immunity to tuberculosis I have dwelt. Mr. Poole found among these Jews of the Market Street side hardly a case of consumption. The body of the block is packed with Irish and Italians and a sprinkling of twelve other peoples. Of two hundred and sixty-five cases reported on the block, one hundred and four cases came from six old tenements alone. At No. 144 Cherry Street, we observe, there were eleven cases of consumption in one year.

One house, called the "Ink Pot," has front and rear tenements, five floors high, with a foul narrow court between. Here live one hundred and forty people, of whom twenty-three are babies, and here the plague thrives in darkness and filth,—filth in halls, over walls and floors, in sinks and closets.

"Rooms here held death ready and waiting for years. Up on the third floor, looking down into the court, is a room with two little closets behind it. In one of these a blind Scotchman slept and took the plague in 1894. His wife and his fifteen-year-old son both drank, and the

home grew squalid as the tenement itself. He died in the hospital. Only a few months later the plague fastened again. Slowly his little daughter grew used to the fever, the coughing, the long, sleepless nights. The foul court was her only outlook. At last she, too, died. The mother and son then moved away. But in this room the germs lived on. They might all have been killed in a day by sunlight; they can live two years in darkness. Here in darkness they lived, on grimy walls, in dusty nooks, on dirty floors. Then one year later, in October, a Jew rented this same room. He was taken, and died in the summer. The room was rented again in the autumn by a German and his wife. She had the plague already, and died. Then an Irish family came in. The father was a hard, steady worker, and loved his children. The home this time was winning the fight. But six months later he took the plague. He died in 1901. This is only the record of one room in seven years. In the rear house is another plague room—on the ground floor, to the right of the low, narrow entrance. Here, in 1896, lived an old Irish hatmaker, with his wife, his small daughter, his two sons. He was housekeeper. He took the plague, worked a year or more there on his hats, then died. The cough came on his wife soon after. She suffered long, weary months, only to see at the end her young daughter begin the same suffering. The mother died. The home was shattered. The girl was taken away by her aunt, and soon followed her mother. The two sons died of the same disease, spreading it out into other tenements. So by this room one whole family was blotted out. This is not all. When the next housekeeper came to this same room with his wife both were strong and well. The man took the plague in 1899. He still fought for life when all knew he was hopeless; he still lived when he could not rise, could barely speak, but only lie alone in one of these closet bed-rooms. There are no fewer than twenty such rooms in this rear house—windowless, six feet by eight. That winter of 1900 brought the memorable blizzard. While it was raging, a settlement visitor came to this room and found the water-pipe burst, the room flooded. The plucky little wife had carried her husband upstairs on her back. A few days later his struggle was ended. The wife is still here.

“Infection comes not only from the room, but as well from halls and stairways. An old Italian, a hopeless victim, sits out on the steps in front all day long in the sun, while the children play around him, and all through the evening, with men and women beside him. His cough never stops. The halls behind and above are grimy, offensive, hung heavy with cobwebs, and these cobwebs are always black. The stairways in the rear house are low and narrow, uneven, and thick

with dust piled up in every nook and corner. This dust is virulent with disease. Through the years a score of consumptives have lived here, groping their way each night up the stairways, stopping on the landings to catch their breath and cough, and so spread the infection. But for light trickling through grimy panels in doors, these halls are forever dark. It is in halls like these that the germs can live two years or longer. It is with halls like those outside that one clean room cannot bring safety."

Thus does Mr. Poole narrate the history of one tenement; nor have I given all his narrative of this one house. In every crowded quarter there are stories to the same effect and of like import.

One "servant of the slayer" is the air-shaft; there are thousands of tenements with air-shafts five by five. Rooms opening on these are technically dark. Such a shaft is two feet wide by fifty feet deep. It is foul with garbage, decayed refuse, old clothes and filth. Many of these tenements, moreover, have no skylights. All the hot, fetid air from below rises up, and having no vent above, settles in the halls and rooms throughout the house.

But we may not linger further over Mr. Poole's fascinating but sad and grewsome story. The reader must not fail to get the whole account of the tenement called "The Bucket"; of another called "The Morgue", because of the many lives which the plague has taken in it; of rooms pathetically called "best rooms"; of unspeakably filthy school-yard sinks, between which weazened little children play hide-and-seek; of pork-shops, where huge cauldrons boil day and night, while near by runs a huge sewer-main, its odor, from "three gaps the size of your fist" and two long rents, mingling with that of the boiling fat; of little children who play in hallways, dark and filthy, with grimy streaks on walls and ceilings, because the good mother would not have them on the street, where drunken men and women are to be seen at any hour; of there being eight saloons on one side of the street alone and several houses of ill-fame; of gentle Rosalie, a "little mother" of seven years, who took care of three still younger than she while her mother was out scrubbing, and who became a pitiful sight, "only skin over bone," until death benignantly came to her; of the Danish wife who saved her husband, despite the doctor's prognosis, by her iron-strong mind and soul, declaring that "all doctors were fools," that he was "a coward," and that "he *must* get well."

Mr. Poole has found that many consumptives wait until they are no longer able to work; then they see a doctor, and at last are reported hopeless. "The hopeless report; the hopeful don't. Why?

Because places of cure have up to lately not inspired hope and trust. Because the city's accommodation has been hopelessly inadequate. Because the disease has heretofore been supposed to be fatal. Because the poor fear to lose their insurance. Because they want to live to-day, not after six months of tedious, doubtful recovery. Because many are unwilling to leave home, and to sunder its ties. Because they won't give up." The right time, the right place, the right way are all demanded. The sick will never report at the right time until they believe they can be healed; until they know we have the right ways and the right places to cure them. These right places must now be made. They are being made, and many of the defects have been and are being remedied, thanks to such earnest agitation as is promulgated by Mr. Poole.

CHAPTER V

PREVENTABLE CONDITIONS

If preventable, why not prevented?—WITHERED.

DURING several summers past I have been inspecting the weekly parties which a New York charitable society has been sending to the seashore. The main object of these inspections was the exclusion of cases of infectious disease. But besides this there was to me much else of professional interest, and which was germane to our subject.

Women and children made up the parties, and many of them, especially the infants, needed greatly the change from the air of the tenements to that of the sea. The eyes of these latter were sunken, their colorless faces had a clammy sweat upon them, their limbs hung flaccid, and they were listless and quite without the restlessness characteristic of healthy early childhood. Their appearance connoted the vitiated air, the poverty of sunshine, the pathogenic lack of cleanliness, and the dreadful summer heat in the crowded tenements of this city. To comprehend well the condition of these people one should examine some of the thousand odd photographs taken by the Tenement House Department of New York City, some of which are here shown.¹

Many infants and children evidenced irregularity in feeding and overfeeding. The conditions which thus obtain will probably never be entirely corrected,—crying and peevish infants, and solicitous mothers who know of no better way of pacification than the giving of the breast. Medical men have done much in the way of education here, but maternal instincts have not thus been entirely overcome.

Many infants were very much overclothed,—eight garments upon one infant; seven upon another of three months, “so as not to make a bundle.” A weak infant of two months, whom the mother felt was gradually getting worse, was enveloped in nine hot, moist garments. One mother had four children die of “bronchitis.” Therefore she covered her baby’s thorax heavily with woollen garments; so that it has no doubt since gone the way of the rest. Another had a reddened face and it puffed laboriously. The mother wanted to know why it had prickly heat. Its clothing was removed. There was a flannel binder, then two woollen garments, next a cotton shirt, and lastly a heavy woollen cloak. And so on.

Cases of neglected middle-ear disease were often manifested; as were also enlarged tonsils, adenoids, retracted *alæ*, contracted chests with resulting oxygen starvation. These conditions, with swallowed excreta (often bacillus-laden) from the upper air-passages, mingled with unwholesome food and fluid, furnished ideal predispositions to tuberculosis.

It was a pleasure to anticipate the benefit these poverty-stricken women must have received from their outings, which lasted from one to two weeks,—women who have borne many children, who had chronic affections of various organs; old women going for convalescence after treatment or operation in hospital, or who were going to recuperate in order to undergo operation on their return. Many women regained thus the tidal strength of body which they had lost in the stress of the winter months, having been compelled to draw constantly upon the reserve force which should normally remain latent for emergency or unusual ordeals. Many seemed indeed to be in a condition when the proverbial last straw would be fatal.

Among these women one much emaciated was married at sixteen, and her first child was born at seventeen; another was married at fourteen and had a child before her sixteenth year; another of twenty-six years had a child of twelve; one thirty-seven years old had had nine children; another of the same age had had eleven, of whom eight had died; another, aged thirty-one, had had ten children; another at thirty-six, having nine children, had just come from giving birth to a tenth in a maternity hospital. Another had had eight children, but two of whom were living. She wept over "a beautiful baby, with lovely gold hair," that had died a few days after its birth. The other five had died at almost the same time of "diphtheria and scarlet fever, that had been brought into the house." This woman's dissatisfaction with the part allotted to her in the universal scheme was not because of the number of children which she had borne, but because they had been taken from her care.

One mother of seven children had to go out to work during the day—and showed it; there were tea-drinking mothers with weak spells, so that they felt "faint-like"; a mother who gave her baby the breast at night, but had to go out to do washing during the day; several manifested tuberculosis. One woman had made a splendid fight. She had been playing the game of life with an optimism most pleasing to contemplate. At thirty-six she was the mother of nine children. "Are you well?" I had asked. "Sure," was her answer, with a grin and a wink, "only for that I couldn't stand the racket." Since then this heroine has died of consumption.

Awhile ago we were vouchsafed some strenuous expressions—as unquestionable as they were platitudinous—upon the subject of race suicide. When we consider the life-stratum here sketched we must conclude that the matter is not so readily adjustable as might appear to the superficial observer. Would that the means for nurturing their families were commensurate with the affection these mothers bear their offspring.

As I look back upon these inspections I seem to have been contemplating a truly Hogarthian panorama. Old women, mothers and children passed by me successively,—old women who could but guess how old they were, and who were suffering from rheumatism, asthma, heart disease, and the like; a lame woman over seventy, whose leg had been broken in childhood; a child with tuberculosis of the hip, that had two abscesses draining away its strength; a child who was a cretin; another with scoliosis; an infant, thin, weazened, marasmic, that had the bottle given it “whenever it cried”; a child with “stomach trouble” that gripped a huge cracker and had its mouth filled to overflowing with half-masticated food, which was supplied it whenever it wanted something to eat; a child having its face disfigured with impetigo; a large family coming by themselves, their mother being sick in hospital; several members of a family all obviously hysterics; children aged two years still suckling, their mothers hoping thus to avoid pregnancy; a young woman with hysterical paralysis, which came on shortly after her marriage—with a Chinaman; a woman who could not remember if she had three or four children, and had to ask her mother to tell her; a woman who, to her great sorrow, had lost one among eleven children; an idiotic child who had become so after an attack of cerebrospinal meningitis; a child with facial paralysis, which came on as the result of a button having remained for months unsuspected in her nostril; a woman with exophthalmos, fast-beating heart, and an immense goitre; a woman who alone supported her family, her husband having an aneurysm, which must inevitably prove fatal; a mother with paralysis, consequent upon the birth of her child; a girl of twenty, nearly blind from measles, which she had contracted in childhood; an infant with an enormous hydrocephalus, certainly larger than a man’s head; a boy paralyzed and imbecile since birth; a woman with hysterical deafness, which came upon her in an instant, and which is likely to leave her as suddenly; a woman whose whole left side had been burned, the cicatricial tissue being so tense that she could not bend forward; children choreic; with tuberculous vertebræ; two syphilitic infants whose father had had “blood-poisoning.” A girl in her teens

was hopelessly blind, and had been so since three days after birth; she had contracted an ophthalmia neonatorum from her uncleanly mother. An infant a few months old had a specific eruption distributed over its body. The father had been "burned, and the blood turned into blood-poisoning," so the mother assured me. Perhaps she believed this herself; perhaps she was trying hard to make herself believe it. Here was a feminine subtlety for a De Balzac to dilate upon.

I sketch thus but one among many phases of life such as fall within the experience of all physicians. Evidently lack of foresight and of education and unhygienic living were responsible for most of the conditions here touched upon,—preventable conditions. And this may in general terms be said of the factors which go to make up the pathological entity which we term tuberculosis.

Part VI

PREVENTION

The object of preventive medicine is to curtail and, if possible, to prevent disease, to prolong existence, and to render life happier by means of improved physical conditions.

BULSTRODE

CHAPTER I

PRELIMINARY

While we must recognize the brand which is put upon us at birth by heredity, nevertheless most of the ills of life are due to environment. The conditions under which we live are responsible for them. This environment is changeable. Herein lies our hope, and to this end must we direct our prophylaxis.—POTTENGER.

THE development of tuberculosis, as we have seen, depends upon two main considerations: First, the presence of the Koch bacillus and of its allied micro-organisms; and, second, the condition of the body by which it becomes predisposed to infection. Logically, then, to prevent consumption the bacteria must be destroyed, and the body must be fortified so that it will be made resistant to invasion.

As regards the first of these two propositions—the destruction of the germs—the procedure is, theoretically at least, an extraordinarily simple one. It enters the organism by means of inhalation, or by ingestion, or by absorption through wounds or abrasions in the skin and mucous membranes. To the disposition of infective material in each of these phases we devote a chapter. The latter of these propositions—the fortifying of the body—is of at least equal importance. For, as we have seen, practically no one ever escapes contact with the germ; and those of us who are not tuberculous are so because our systems are strong enough to fight it and to resist triumphantly the invasion. To this part of the subject, then, we devote the remainder of the chapters on prevention.

CHAPTER II

INHALATION

Prevention is better than cure—and much cheaper.—JOHN LOCKE.

THE mere breath of the consumptive is not infectious. But liquid particles may be ejected during coughing, sneezing, or speaking. It has been demonstrated that such particles may remain suspended in the air for a distance of some twenty feet and will then subside by gravitation. Infection may thus be conveyed, the sputum which is emitted, if it be not disposed of properly, being deposited at home upon floors, carpets, walls, napkins and dishes; or abroad, in public buildings, public vehicles, and the like. And this sputum dries and is taken up in the air or dust which other people breathe. Sunshine, fresh air, and pure water destroy the bacillus. Nevertheless, these agents do not always destroy it, because the broken-down tissue contained in the sputum, or the sputum itself, or the dust with which it becomes incorporated, makes a caché or envelope for the bacillus, which may give it some protection. So that, except in gutters, there should be no spitting in public thoroughfares. Flies may thus carry about infection; and shoes and trailing skirts may take it into homes.

The consumptive should invariably, while indoors, have some cloth or tissue paper before his face during coughing or sneezing. Many bacilli will be revealed in such cloths upon microscopic examination. And he should spit into a receptacle made expressly for the purpose. If this be a cup, it should be made of card-board; or of metal, glass or porcelain. The latter should be partly (not completely) filled with water, or a watery solution of a disinfectant. The sputum must not be left to dry in the vessel. The card-board receptacle should be burned every day. The cup, if of durable stuff, should be emptied into the closet at least twice a day, and carefully washed with boiling water. Consumptives who are too weak to use a cup should use moist cloths. They must be taught not to let their sputum soil their hands, face or clothing. In this event there should be frequent ablutions; and soiled clothing should be washed at once with soap and hot water. They should brush their teeth constantly; and should rinse and clean out their mouths especially after eating.

Male patients had best be clean-shaven; if they will not, their beards and moustaches should be abbreviated as much as may be,

and kept as cleanly as possible. There should be frequent, at least weekly, shampoos.

All spitting should in general terms be frowned upon. It is an uncleanly and often an unnecessary habit. The sputum of early and obscure tuberculosis may be infectious. The germs, not only of this disease, but also of others—pneumonia, diphtheria, influenza and the like—may thus be distributed. Besides, universal observance of a rule prohibiting this practice would deprive it of its sting for the sensitive consumptive. (Cornet.)



FIG. 38.—From the circular of the Illinois State Board of Health. (By courtesy of Dr. J. A. Egan.)

Whenever the patient leaves his home, either temporarily or for the day's work, paper napkins or old cloths or card-board pockets should receive his sputum. This is in the highest degree essential as regards the workshop. Advanced consumptives who work near their fellows, such as tailors, might use the Fraenkel respirator, a metal mouthpiece provided with a shield of cambric or gauze, which may

be frequently changed, and which effectually prevents the dissemination of the cough spray. However, to wear a mask thus is impracticable, and a great hardship, and it is comparatively unnecessary. Cornet finds that the dissemination of bacilli by coughing is insignificant in comparison with the number liberated by the drying of sputum.

The cloths and paper thus used should be put into paraffin paper or ordinary paper bags to be burned on returning home. Handkerchiefs should not be used for sputum. But if they are, should be boiled half an hour separately before being put in the general wash.

The elegant consumptive may have a metal receptacle (ornamented in any way she may fancy) which, in obedience to the natural wish not to draw attention to her illness, she can carry concealed in her handkerchief. Manufacturing houses make all sorts of receptacles. There are card-board affairs costing the fraction of a cent. Nevertheless, there are many (perhaps most) consumptives who cannot afford even this. But tissue paper in plenty can easily be had, which can be cut up into convenient sizes. And any corner grocer will gladly (such is the subconscious Christianity which I find to be prevalent among the poor) furnish without price all the paper bags that are needed. So that the poor patient may put a bunch of papers in his pocket with one paper bag. And as he has occasion to use each paper he puts it into his bag and burns the whole on his return home. Or he may use a waterproof receptacle, as a tobacco-pouch, which should be cleansed and boiled frequently. For those too weak to sit up a small card-board cup, with a handle, should be used.

Spittoons of all sorts are made. Those which lie upon the floor should be covered when not used, and should be partly (not entirely) filled with water. There are spittoons made upon stands breast-high. There is one in which the receptacle for sputum is hidden, and may be pulled out for use like a drawer and then pushed back out of sight. Above this device is a flower pot; and the pious fraud is practised of having the visitor think it is only a flower-pot and nothing else. Such a spittoon, being on a stand, with heavy metallic base, children playing on the floor or domestic animals are not in danger of infection. Or wall cuspidors may be utilized. These have the advantage that they cannot be tipped over; vessels such as these should be supplied generously in factories and workshops. They are made to be covered when not used, so that insects cannot get at them.

For use on sanatorium grounds and at health resorts, Knopf has devised an excellent contrivance—a self-cleansing spittoon, supported by heavy tubing and made of copper coated with pure tin on the

inside. To the upper edge is screwed a perforated lead pipe which supplies the water for constant flushing. The heavy tubing is to be connected with the sewer, and the lead pipe is to be attached to the street hydrant.¹

The possibility of contamination by kissing must be considered. It were a pity, indeed, to interfere with emotional spontaneity and the comfort resulting from interchange of affections, under the unfortunate circumstances we are considering. And one osculation isn't going to produce consumption any more than one swallow will make a summer. However, in general terms, consumptives should kiss as little as may be; and should not, in any event, kiss others, especially children, upon the mouth.

The consumptive should sleep alone; in his own bed, and, if he can, in his own room. His clothing, bedding, and the like, should be boiled at least half an hour before being added to the general wash. His handkerchiefs should be soaked in antiseptic solutions, and then boiled separately; if antiseptics are not handy, boiling will do. Let him use old cloths. The dishes, etc., from which he eats should be kept apart, if possible; perhaps they can be had shaped or colored differently from those of the rest of the family. In any event they should be thoroughly cleansed by themselves in boiling water.

The bedridden patient, especially during the last few weeks of his life, will be quite unable to prevent the spread of infection. It is essential, in such cases, constantly to clean everything that may become soiled; and to keep a pail containing a disinfectant at hand for that purpose. Into this pail clothing, blankets, sheets, towels, etc., used about the patient, should be dropped immediately after use and before being removed from the room.

Every room, especially every bedroom, should be thoroughly ventilated. Air that is constantly rebreathed soon becomes poisonous. Cold air, by the way, is not necessarily pure, simply because it is cold; it needs changing just as warm air does.²

To have rooms constantly supplied with fresh air there should be

¹As I proceed with this subject of the consumptive's sputum, I fear it becomes more and more disagreeable to the lay reader. However, there is no help for it. I used, in attempts at mitigation, to speak in my work of expectorations. But I learned that President Roosevelt, in the cosmic range of his activities, had taken this important subject under consideration, and had issued a State paper from the White House to the effect that the correct term is "spit." So "spit" it is; and must continue to be.

²For Disinfection, see Appendix A.

an arrangement by which air from out of doors is supplied all the time. A current from room to room will not suffice; the air must originate from out of doors. It were best to have the foul air exits at the floor level, so that the general drift of the air would be downwards and not upwards into the nostrils. The room need not be cold,—a fire on a cold day is essential to health; but a room can be ventilated and warmed at the same time. Stoves are generally supplied with vessels containing water, which is supposed to absorb deleterious gases. I do not think this plan effective; but among the very poor stoves are nowadays almost the only means of heating. Stoves are in a measure pernicious. They are ravenous of oxygen, and they emit poisonous gases, such as result from imperfect combustion.

An open grate or a register may cause a sufficient current. We may raise the lower sash of one window several inches—never less than an inch—and lower the upper part of a window adjacent. There should be such a current in the sleeping-room all night long, and there will never be a night so cold that this should not be done. Or we could raise the lower sash six inches and fit a board beneath it, so that air will pass between the sashes. Dust-excluding nets and like contrivances are made cheaply to fit into these spaces. Of course, draughts are to be avoided by the sleeper. This can be done by means of screens or blankets hung up. There will be no draught when the air comes from one side only. The ordinary indoor temperature should be between 60° and 70° , never more than the latter; during the night it should be much lower. These observations are of general scope. The consumptive patient, as we shall see, sleeps (well covered) with wide-open windows, no matter how cold the night. The house should, as much as possible, be permeated with dry air and sunlight, which kill the tubercle bacillus.

The house is the place where infection is most developed; and by a house is meant any enclosure which may, by reason of negligence, uncleanly habits, or indolence, become dark, dirty, damp, and ill ventilated. Under this category, then, are to be considered private dwellings, but also many other structures,—in fact, any enclosure in which people may congregate. Among these certainly the most important is the factory or the workshop. Here, as in all places where many come together, there should be spittoons in abundance; and there should be plenty of air-space between the workingmen. Factory conditions, though now much improved, are still generally very unsanitary; and it is here that the consumptive workman should make the proper disposition of his sputum an obligation as serious as any in life. For the matter coughed up, if distributed in the oppressive atmosphere

which prevails in many workshops, becomes exceedingly infectious. Saloons come next in order of infectivity. Many poor fellows who are consumptive frequent them, and the atmosphere in them is generally soggy and unhygienic in the last degree. The strictures laid upon factories and other places should in even greater measure be laid upon them.

Family hotels, boarding- and lodging-houses come next. They should have periodical renovation, at least weekly. Hotels for transient guests should have rooms occupied by consumptives thoroughly disinfected. This is now systematically done in many hotels. The danger here is not so great as in rooms permanently occupied. For tuberculosis is relatively not to be feared from occasional contact.

Of course, good results from scientific cleanliness (disinfection, etc.) cannot be assured if the grounds in which the house is situated are not also attended to. Scrupulous cleanliness should be enforced within and without the house, wherever it may be. All decaying animal and vegetable matter and every kind and source of filth in and about the house should be removed and disinfectants should be freely used. Surface drains and gutters, areas, out-houses, closets, shelters for domestic animals, fowls, etc., should be constantly attended to. Basements and cellars must be kept dry and well aired. Here unslaked lime should be used freely.

In general terms, the paraphernalia incident to certain occupations should receive attention; glasses and dishes should be washed thoroughly in saloons, restaurants, quick-lunch counters, at soda-water fountains, and ice-cream "parlors." There is an ingenious "public cup" made—practically a miniature fountain through which the water spouts up—and to which one stoops and drinks without having his lips touch the vessel. In laundries, cook-shops, fish-markets, and like establishments, there should be scrupulous cleanliness.

In public conveyances, especially during "rush hours" in big cities, when the elevated- and street-cars are indescribably crowded, when men have to hang desperately upon back platforms in order to get the ride they have paid for, there is danger of tuberculosis infection. A consumptive passenger may, in coughing, impregnate the already much vitiated atmosphere of the car; or minute droplets of his sputum may be deposited upon the clothing of his fellows. We may here include the ferryboat, where the "spitting hog" does his proudest, and the waiting-rooms in the railroad stations. The dust-inviting upholstery in railway sleeping-cars is still more a menace, for passengers remain in them longer. It is now an excellent feature of some roads that they provide special cars for consumptives.

The problem of the subway air in New York City has become a subject of discussion. It was all begun when a lady fainted in a subway-car. Of course this incident is inconclusive; for ladies have been known to faint under most salubrious conditions. It was found by Professor Chandler that the subway air contained practically as much oxygen as the air above in the open; it could, therefore, hardly be an unduly vitiated atmosphere. However, the following aspects of the tuberculosis situation are here peculiar: sunshine, which destroys the bacillus, does not enter; spittoons should be provided at the stations, and those who spit anywhere else than in them should be sternly dealt with, much more so than on the open thoroughfare; the spaces between the tracks should be asphalted, so that they may be easily cleansed, instead of as now, when the road-bed is made up of broken stones; and workmen in the tunnel with predisposition to consumption should certainly be induced to seek other employment.

It is unquestionably very important—considering the tender tissues of children—that school-rooms should be very light and well ventilated; and that they should be cleaned often and disinfected regularly. This is now, I believe, well done in New York City schools. Stores and offices where business is done should receive like treatment.

Court-rooms, in my haply limited experience, are abominably ventilated. In taking the oath, the Bible should not be kissed, at least not the cover. It is difficult to perceive how any predisposition whatever can escape development in the tissue-destroying psychology which is generally pervasive of these temples, where *Jus* and *Lex* so incessantly and so inconclusively play hide-and-seek with one another.

Public halls and meeting-houses are infrequently used, and for but brief periods; so that tuberculosis infection is comparatively not so much to be feared in them. Nevertheless they should be subjected to the general principles of hygiene.

Churches are, for the same reason, not so dangerous for infection. And cleanliness, which accompanies the religious sense, obtains generally in them. Still, the following circular issued by the Bishop of Fano, quoted by Knopf, is *à propos*:

“(1) In every church, the floor must be regularly cleaned with sawdust saturated with a strong sublimate solution. This thorough cleaning should take place particularly after holidays when great masses of people have visited the church.

“(2) Every week all ordinary chairs and confessional chairs must be thoroughly cleaned with moist rags.

“(3) The grate of the confessional chairs must be washed every week with lye and then polished.”

Crosses, statues, and like symbols, which are kissed by the devotional, should be reverently cleansed from time to time. The likelihood of tuberculosis infection during the communion service is so remote that I do not consider the use of individual communion cups essential. There is here a fitness in considering religious emotions; man shall not live by prophylaxis alone.

The danger of infection in the public thoroughfares is not great. In the open air there is comparatively least danger, for the bacilli are generally destroyed by sunshine and fresh air and water. Still, the possibility is not to be ignored. The streets should be thoroughly cleansed, if only on general principles. Besides, many infections other than tuberculosis may be contracted upon or from unclean streets. And it is unquestionably important that the dust should be laid by frequent sprinkling and watering. Dust containing germs may be brought into clean houses upon boots or clothing which has been trailing upon the streets. And by dusting and cleansing these garments within doors sources of infection are no doubt often set free. Moreover, gentlewomen tell me that when they take the air they have to watch and pick their way lest their skirts become soiled. This consideration will surely appeal where others would not receive attention.

The arrest of spitters is no easy matter. The New York Health Department has proceeded vigorously, and accounts of arrest and consequent discomfiture of many spitters has surely produced a wholesome effect upon others. The gutters are for this purpose. In street-cars the citizen might proceed by looking along the streets as the car goes by until he sees a policeman, whom he should then hail and require to arrest the spitter. It will be essential for the citizen to go along as witness and complainant against the prisoner. Under all the circumstances this course will require much self-sacrifice and public spirit. I understand that policemen are now detailed at allotted stations upon the elevated roads. It is certain that in these matters of public decorum we are quite too complacent. In this land of the free and the unlicensed we endure much that would not for a moment be tolerated in "effete" European communities.

CHAPTER III

INGESTION

For that which befalleth sons of men befalleth beasts ; even one thing befalleth them : As the one dieth so dieth the other ; yea, they have all one breath, so that a man hath no pre-eminence above a beast.—ECCLESIASTES.

THE extent to which ingestion infection occurs is as yet an unsettled medical problem. That it does frequently occur is unquestionable. That the settlement of this question is of great importance is manifest. However, from a broad human view-point—not alone that of the medical man—it is axiomatic that only fresh, clean food and drink should be consumed. Uncontaminated meat, milk, butter, vegetables, fruits, and pure water are essential ; we need no scientific argument to this end.¹

Practically, the thorough cooking of meats is a sufficient precaution. In case of the slightest doubt the viscera of animals—the liver, kidneys, etc.—should not be eaten. In them tuberculous processes thrive to a much greater extent than in the musculature.

The question of fruits, fish, and other eatables, as also merchandise vended on push-carts, is a very important one. Much of this material which is displayed for sale on open-air stalls and carts provides a convenient receptacle for dirt and gathers many varieties of micro-organisms, some of which are distinctly prejudicial to the public health. Among these the tubercle bacillus from infected dust and spray spread by coughing has redundantly been demonstrated. We may note that—

The consumptive should not cough lying on his back, and should not swallow his sputum nor excreta from the upper air-passages ; he may thus contract intestinal tuberculosis.

The bacilli have been found in the abdomen and excreta of flies ; there is, therefore, some danger from this source.

Many infants contract the disease through taking into their mouths infected objects while playing on the floor.

Human excreta containing the bacilli are in general effectively disposed of ; there is practically no danger from them.

Nothing short of lynching should serve for cigar-makers who seal their cigar-wrappers by means of their spittle, and for bakers who paste labels upon loaves by the same method.

¹ Part XIV, Chapters IV and V.

CHAPTER IV

INOCULATION

If one takes a larger view, and grasps the root of the evil, the rare and occasional modes of infection may be disregarded.—CORNET.

THIS mode of infection is comparatively rare. It is incurred generally through open wounds, especially of the thorax. Surgeons, students in the dissecting-room, and butchers are especially liable. We should recall that the bacillus may even traverse the unbroken skin and mucous membrane.

Those who clean glass or painted metal should be careful, especially if they have open sores or abrasions on their hands. Servants who clean spittoons should certainly wear rubber gloves while doing so. If infection is feared, cleansing and surgical antiseptics should be employed in dressing or bandaging the wound.

By way of *résumé*, then, concerning the disposition of infective material we observe that, especially with regard to inhalation infection, it is essential to have a sense of proportion, to consider the degree in which infection is likely to be incurred. We should apply the underlying principles here set forth to the varying circumstances in a given case. We should appreciate that in darkness, damp, dirt, uncleanliness and vitiated air the tubercle bacillus thrives, and that sunshine, fresh air, and pure, clean water kill the germ. We rightly emphasize the danger from the indoor inhalation of the bacillus, but not so much do we emphasize the possibility of infection on open thoroughfares. It is essential to have this sense of proportion, because our lives and those of our lay fellows would be unlivable if we were to be constantly fearful of infective processes. To live thus would be an effective way of inviting infection.

The Maryland Tuberculosis Commission makes these succinct statements :

“Measures of general public protection, such as the control of promiscuous spitting in street-cars and public places, while of course of great value, do not reach the largest sources of dissemination of the disease. It cannot be claimed by any student of tuberculous infection that three per cent. of tuberculous persons have received their infections in street-cars or public buildings.

“While some conservatism must be maintained against the more extreme views, there seems good reason for acceding with the belief held by many of the most careful investigators that tuberculosis is essentially a house disease.

“The repeated exposures apparently necessary to engraft a tuberculous infection would probably cause liability of public infection to take a secondary importance. Of the infections of reasonably definite origin probably from ninety-five per cent. to ninety-eight per cent. take place in the living-rooms of those affected, while a further considerable percentage takes place in the work-rooms.”

If we do not maintain and teach this sense of proportion, if we do not constantly bear in mind the scientific principles upon which the warfare against tuberculosis is based, the work will certainly not bear a righteous measure of fruition. In this country, at least, no measures will have success or compliance which are not generally understood to be rational and feasible, and which have not the sanction of public approval.

It is quite appropriate here, I think, to set forth a letter by a genial clergyman whom I have the honor and the good fortune to know. It was occasioned by my having sent him a reprint of a medical article I had written :

DEAR DR. HUBER :

I thank you very much for your pamphlet on ——. I cannot say that it is easy reading. The words of brobdnaggian majesty and geological construction made getting along like riding on a log road. It is fortunate that one is not confined to such words in making love or even in preaching. Theology has much to answer for, but for outrageous nomenclature science beats her ten to one. There is hardly what I should call a smooth and gentlemanly spoken line in the book. It reads as I should suppose a human mastodon would talk. Even the names of your authorities sound as if you had picked them up in the Indian Territory or Southern Russia, or even Independent Tartary,—Kelynack, Biggs, Bullstrode, Schmorl, Sajous, Metchnikoff. Still, the book is fine. I feel braced up by it, just as I do when I have been chopping trees in an Adirondack camp in winter. And yet I laid the book down with a certain fatalistic fear. If all those things are after a man, of what use to struggle at all? Better die at once. What can a fellow do, for example, when tuberculosis excreta from the mesenteric glands gets into him, or when he beholds upon his tongue undigested bacilli with intestinal hyperæmia and chyle? Better make your will at once, and leave your money to the publication of a new dictionary.

Yours thankfully and sadly,

CHAPTER V

MARRIAGE AND THE OFFSPRING

Many a young man has sacrificed his chances of recovery on the altar of Hymen.—FLICK.

WE here consider such predispositions as may obtain up to the period which terminates infancy.

To do this comprehensively would seem to require the expression of a Hibernicism,—that to fortify the organism with a view to enabling it to withstand infection we must begin long before the birth of the child; or, as Oliver Wendell Holmes whimsically expressed it, “a man should be careful in the selection of his ancestors.” Yet if we consider the matter deeply, we will be proceeding quite logically. For birth is but an incident in a succession of biological processes; nor is conception indeed anything else than a transmutation of older cellular elements, such as are contained in the ovum and the sperm, into a new cellular compound. And it is after all with the quality and virility of cells that we have primarily to do.

The practical deduction here is that those who contemplate marriage should proceed with caution, if they are conscious of any abnormal stigma, any suggestion of degeneracy in themselves. Undoubtedly the possibility of parentage on the part of men and women who are unfit,—the nearly related, couples whose ages vary widely, the neurotic, or pervert, or insane, the drug-habitues, those who have hereditary taint of alcoholism, the syphilitic, the consumptive,—the possibility of parentage among such as these should be precluded as far as possible. Generally speaking, all such are likely to transmit to their offspring vitiated tissues, upon which with unusual ease the Koch bacillus and its allied cocci may implant themselves and multiply. The principle of “natural selection” will act to prevent many such marriages. However, when they are contemplated, and the physician’s advice is asked, he should permit no marriage where tuberculosis is active in either man or woman. Especially with regard to the latter is to be emphasized the possibility of death in childbirth, or perhaps even graver likelihood of physical wreck and death by lingering stages subsequent to delivery. The physician should certainly not approve—for her own sake—the marriage of a tuberculous woman. “Pregnancy is found to complicate, to precipi-

tate, or to develop phthisis remarkably." (Osler.) Another author states too truly: "When consumption is hanging about a girl, the distance between the marriage-bed and the grave is usually short with her. The husband, if he do not become a widower soon after the birth of the first child, may count upon a perpetually ailing wife."

A consumptive should not marry a person in health, especially if the disease has existed a long time and is progressive; moreover, a latent tuberculosis may thus be transformed into an active and acute manifestation.

On the other hand, a patient who has had no physical signs or other discoverable symptoms for two years, and whose metabolism appears to be normal, should be allowed to marry. Cornet considers there should be no marriage so long as the disease progresses. However, after there has been a relative recovery, when the symptoms have been in abeyance for two or three years and a satisfactory general condition has been maintained, marriage need not be objected to. If a man be sufficiently well-to-do, and if his wife makes no great demands upon him, he is better off married than a bachelor, with all the unhappiness and discomfiture the latter implies. On the other hand a woman may be seriously harmed by marriage, with all its consequences. She should be strong and toned up beforehand, not only for her own sake but for that of her offspring also. Conception must be advised against in consumptive women; they stand the puerperium badly. The disease often assumes its most acute form after childbirth and then proves rapidly fatal. To save the mother's life interference may have to be counselled. Multiple births should certainly be discouraged.

After the melancholy features have been fully dwelt upon, the bright side of the matter is entitled to consideration. Although the observation first set forth concerning the transmission of a vulnerable organism by tuberculous parents generally holds good, many instances are scientifically recorded¹ in which the offspring of consumptive parents have been found to be singularly immune to that disease. Cornet has "seen a number of such marriages give origin to many children who are perfectly strong and well developed."

Besides, there are many (blessed and glorious fools) who will marry without regard to the opinions of physicians. I once met a fine old man in whose marriage the element of spontaneous and uncalculating love happened to have a place. His mother had counselled him not to marry his beloved, who was consumptive.

¹ Flick, King.

Nevertheless, they did marry and immediately after went into the country. This was many years ago when the profession were not lauding sunshine, fresh air, and good food in the treatment of this disease. He went at once to the butcher and made arrangements for the best meats to be sent to his house. Then he went to a neighbor who had a large vegetable garden and asked him to name his price (that was no object; no matter what it was it would be paid) for the privilege he desired of going into this garden as often as he liked and taking away as many vegetables as he should please to. And then to others who had good nutriment to sell. And so this couple lived together; and the wife did not die of consumption, but achieved good health and lived to bless him through many years. Was ever man more deserving of happiness?

When a consumptive has married the pair should be counselled that intercourse should not occur in times of bodily or psychic fatigue, or during such ill health as complicates the original affection.

When conception has occurred the physician will recall that during embryonic life the cells of the body become differentiated, and the organs are formed, increase in size, and begin to take on their several functions; that during this period the organism of the coming infant is most acutely sensitive to environmental impressions,—such as variations in oxygen supply, warmth, the constitution of the maternal blood. Before the birth, then, the mother should be safeguarded to the fullest possible extent, for the good of her offspring. She should have wholesome diet, sensible and hygienic clothing, should rest well at night and for an hour after lunch, and have frequent baths in tepid water, and the like. Especially should she be subjected to no undue mental strain or excitement.

If, unfortunately, the child at birth exhibits stigmata, either functional or anatomical, the physician should act without delay. He may have to deal with manifestations of the scrofulous temperament,—the pallid skin and flabby flesh, tedious and subacute inflammations of the mucous membranes, enlargements of the lymph glands, unhealthy throats, bronchitis, disorders of the gastro-intestinal tract, sluggish metabolism. There may be strumous malformations of the chest, deficient ossification, stunted and weazened growth, a capacity for breathing obviously below the average, a defective development of the circulatory system, and impoverished blood. Rectification to the normal point may be impossible. Nevertheless, everything should be done to mitigate abnormal conditions as much as may be, not only for the sake of the child itself, but for the avoidance of baneful effects upon future generations. Functional modifications are more important

than anatomical ones. They are more likely to be transmitted. And obviously they are more amenable to treatment. Although there may be no definite anatomical stigmata, a pernicious nutritive habit is often transmitted, with which the physician may have to deal. Such patients will have to be kept under observation, not for weeks or months, but for years.

A weak and consumptive mother should not nurse her infant. Although there is little likelihood of her milk itself being infected, it is generally not sufficiently nutritious. Lactation is a great drain upon the mother's strength and may precipitate a fatal termination to her disease. Besides, the infant may contract inhalation tuberculosis while taking the breast. Either a wet-nurse should be found or the infant should be bottle-fed. The latter is the better way, in view of the well-nigh perfect system of infant feeding which physicians have now evolved. In large cities, both public and private charities have become so active in this regard that the poorest people may have excellent milk, properly modified, at little cost, or no cost at all, if need be.

The separation of an infant from the tuberculous mother is a matter not easy of adjustment or decision. Certainly there is little occasion if the mother be properly instructed and conscientious, and if the infant be bottle-fed. The maternal impulses should receive much consideration. Such separation is often impracticable among the poor. In many cases it were well if the mother would have her child taken care of for part of the day in a general nursery, such as the charitable provide in cities. Many poor people cannot be without their children; many are not willing to be: separation should not be—nor can it be—compelled. In any event the infant's home should be made free of infection by disinfection and thorough purification. The floors should be particularly clean, and carpetless, if possible. The infant should be properly clothed and well bathed.

Adenoids and enlarged tonsils should be removed. The child must not be starved for oxygen. Sleeping children should have plenty of air. Their uncovering themselves in cool air need not be feared. Sleeping garments of the grain-bag variety may be provided them. All respiratory and circulatory affections—sore throat, bronchitis, anæmia and the like—should be efficiently treated. Convalescents after weakening diseases—diphtheria, pertussis, measles, scarlet fever—should be carefully nurtured, and, if possible, sent into the country. Pains in the head, "running ears," and abdominal symptoms should be promptly considered, as also accidents or injuries involving bones or joints. The latter often engender tuberculous "white-

swellings." All young structures are less firm, less organized, and less vulnerable than those of the adult.

As soon as may be the child should be taught not to swallow its sputum or excreta from the upper air-passages; these may be bacillus-laden and may cause intestinal tuberculosis.¹

¹Concerning the "hardening" of the child after the period of weaning, see Appendix C.

CHAPTER VI

THE SCHOOL-CHILD

That man, I think, has a liberal education whose body has been so trained in youth that it is the ready servant of his will, and does with ease and pleasure all that as a mechanism it is capable of; whose intellect is a clear, cold, logic engine with all its parts of equal strength and in smooth running order, ready, like a steam engine, to be turned to any kind of work and to spin the gossamers as well as to forge the anchors of the mind; whose mind is stored with the knowledge of the great fundamental truths of nature and the laws of her operations; one who, no stunted ascetic, is full of life and fire, but whose passions have been trained to come to heel by a vigorous will, the servant of a tender conscience; one who has learned to love all beauty, whether of nature or of art, to hate all vileness, and to esteem others as himself.—HUXLEY.

It is evident from a consideration of all that has thus far been set forth that the tender years between early childhood and adolescence must be safeguarded, as far as may be, against both tubercular infection and predisposition to it. As regards the time spent in school, there are many data to be considered.

The school must cultivate, first, health, strength, and energy. After these should come honesty, courage, and patriotism, and then the ability to speak, read and write one's own language, together with a knowledge of arithmetic.¹

Upon this foundation all else may be built. The most important part of any school—public, or private, or boarding—is the school-room. It should be well lighted, and the desks should be so arranged that the light comes preferably from the left side and the rear. This will prevent shadows falling upon the writing. A north light is preferable, if possible to be had, being more uniform. The number of feet of transparent glass should be from one-quarter to one-sixth the floor space of the room.

No school-room should have more than fifty desks; a single teacher cannot well manage more than fifty pupils. Each pupil should have at least fifteen square feet of floor space and two hundred cubic feet of air space. For forty-eight pupils this would mean a room of 30 x 25 x 15 feet.

The ventilation of each room should be ample, not only through the windows, but by means of inlets high up on one of the walls, and by outlets low down on the same wall.

¹ La Petra.

A good gymnasium, or at least a large playground, is essential. There should be shower-baths, and if possible a swimming-tank. The temperature of the school-room is at the Rugby schools from 56° to 60° F. It were well to have a temperature of 62° – 64° for larger, and from 66° – 68° for smaller children. The best method of heating is probably that by indirect radiation. There should be fire-escapes and fire-drills. In boarding-schools the sleeping-rooms, whether dormitories or single, should have the sunlight all day, for its germicidal effect.

An ideal location for such a school-building would be "on some commanding knoll, with a grove at one side, and sufficient grounds around for games and athletics." Thus would the æsthetic instincts and the love of the beautiful in nature be fostered. In cities the school should, if possible, face a park or a small plot of ground. The roofs of city schools should be used as playgrounds. There should be cloak-rooms and individual lockers, so that parasitic diseases may not be communicated by the clothing.

During childhood and youth everything possible must be done in the school to favor the development of a sound physique. There should be games, athletic sports, gymnastics and manual training. "Many of the problems in moral and intellectual training must be referred to the playground for their solution." For any special weakness the gymnasium affords the means of correction. Bathing does more than simply improve the appearance, cleanse the pores, and promote elimination. Cold-baths or shower-baths are an excellent stimulant to the nervous system and give tone and vigor to the muscles. In some German cities the shower-bath is a compulsory part of the school curriculum,—the children going to the baths in relays during school hours.

The amount of study or muscular exercise which produces normal fatigue in a healthy child may produce abnormal exhaustion in a child who is physically below par. The offspring of alcoholic or neurotic parents, the anæmic children, the mouth-breathers and those who have defects of sight or hearing, or which grow rapidly, and especially young girls entering the period of adolescence, are very susceptible to collapse from overwork. These abnormal strains are most apt to show themselves in spring after the indoor life of the winter. Awakened unrefreshed in the morning is one of the early signs of abnormal fatigue. Inability to concentrate the attention, loss of memory, irritability, morbid introspection, and worry, are other signs. St. Vitus's dance indicates a very advanced stage of overfatigue. The

observation of Caillé is apt: "The days of brutally whipping children are gone. We are now refined and whip their brains to death."

The arrangement of studies should be such that those requiring more mental power, such as mathematics and grammar, should be taken up in the morning when the mind is the fresher. Children who are physically weak are often brighter mentally and more studious in their habits than strong and healthy children. They do not engage in athletic sports or exercises of any kind. Unless their studies are directed and restrained within reasonable bounds, they are likely to sacrifice health and perhaps life itself in the rivalry of school studies. Many a consumptive has been developed in this way. Such children should be compelled to be outdoors a goodly part of the time; and very great care should be exercised with regard to their food and their digestive functions.

In many schools, especially in public schools, the children must do one of two things,—either they must take a cold lunch, or they must rush home, gulp down a warm meal in the good old American fashion, and then hurry back to the school-room. This is very baneful during the period of active growth, when there should be plenty of wholesome food, eaten with a decent regard for the capabilities of the digestive tract. A longer recess at lunch-time would perhaps obviate this difficulty. Some one, supersaturated with paternalism, has declared that the community should provide hot lunches for its public-school children. We may yet come even to this!

Bracken would have tuberculous children excluded from public schools, for their own good, and in order that they may not be a source of infection. They should have a few hours for study; and much attention should be given to their physical training and to their out-door life.

Probst advises that it is not necessary to enforce an absolute rule excluding consumptives from school; it is highly essential that every consumptive permitted to attend school should be required to carry out minutely necessary measures to prevent the communicating of his disease to others; that every effort should be made to have early knowledge of consumptive teachers or scholars, medical inspection being the best means to that end; that teachers and older scholars should be fully instructed in the cause, prevention and cure of tuberculosis.

Certainly consumptives should not teach school. Apart from the possibility of their infecting susceptible scholars, the occupation is an indoor one, in which their chances of recovery are not good. Teachers should be fully instructed concerning this disease, so that they may

proceed intelligently concerning ventilation, the detection of predisposing causes affecting their pupils, and like measures. And certainly, all things considered, consumptive children had best have frequent holidays and be out of doors most of the time, proper attention being paid to their food, clothing and exercise. No consumptive should be employed about a school; the school-rooms should be flushed with fresh air during intermission; children should use only their own pencils or other articles which they are liable to put in their mouths; and, of course, they will not spit upon the floor. They should rinse well the school drinking-cup before using; or children should have individual drinking cups, especially where the upward flow faucet is not available; the floors of school-rooms should be scrubbed, and the desks, seats, and window ledges should be washed frequently; the entire school-room should be disinfected every three months; seats and desks should be properly constructed to suit the size of the child, so as to obviate stooping and cramped positions which may compress the chest and prevent natural deep breathing.

Knopf recommends that, wherever possible, instead of American windows, which can be opened to only one-half their extent, French windows should be used, or windows sliding in the wall, or those that turn on a pivot, all of which admit twice the amount of air; walls and woodwork should be plain, with corners rounded off, to make cleansing easy; there should be plenty of indoor singing and outdoor botanizing and geological excursions. Public-school sanatoria for the treatment of tuberculous and scrofulous children are an urgent necessity in nearly all our large American cities.

The logical outcome of the situation as here considered would be the engagement of a school doctor, or a medical school inspector. Medical men are now thus employed in several cities for the detection of infectious disease. In New York City, for a number of years past, these physicians have daily inspected all cases referred to them by teachers, of children who manifested symptoms possibly indicative of diphtheria, measles, scarlet fever, or other infections. Within several years past physicians have made weekly inspection of all children in the various classes. The physician, so far as tuberculosis is concerned, should himself detect, or may be apprised by the watchful teacher, of such symptoms as mouth-breathing, swellings of the glands in the neck, persistent, perhaps dry coughs, catarrhs and running ears; pale or feverish, easily fatigued, nervous or fretful children, and very specially those who have persistent headaches should be carefully examined. As we have seen, tuberculosis in children manifests itself in bones, joints, or in the abdomen, rather than in the lungs. Joints

that are tender, painful on pressure, that swell (white-swellings), undue fatigue of arms or legs, difficulty in swallowing and in breathing, accompanied perhaps by pain on pressure in the vertebræ of the neck; "girdle sensations," referred to other parts of the trunk, with pain upon pressure of vertebræ; frequent urination and irregular movements of the bowels, accompanying pain in the lumbar spine; a distended and painful abdomen, with vomiting and persistent diarrhœa,—such manifestations as these must be immediately attended to.

John Brisben Walker has described admirably the Department of Physical Culture at the St. Louis Exposition. This form of exercises is now no longer confined to universities. It is happily extended in great measure to public schools. The idea here is not of competition, of hurrah and brag, display and school advertisement, but of truly bringing the child to an understanding of its body and advancing it in that physical training which will give it, not skill in games, but a permanent stock of health and efficiency. Fortunately, some ten thousand teachers, from all parts of the country, were able to observe this work, in which the schools of the great city are now engaged. Besides being instructed, most of these teachers are no doubt having the exercises they have seen reproduced in their own schools. The most lasting lesson was found in the collection of photographs on the walls of the gymnasium building, which suggested all sorts of possibilities in the way of "setting up" the hitherto perhaps feebly developed body of the pupil.

What is here emphasized is that no violent competition for the few is needed, but constant, steady development for all. Even a classroom may make a fair gymnasium if there is no better obtainable. Work may, indeed, be performed without apparatus or with only a few inexpensive sticks and ropes. Among the practices which count much for the habit of public-school children is the interruption of studies at periods during the day for "two-minute exercises." At a signal the class drops its text-books, rises to its feet, stretches its arms to expand its lungs, and so goes through a few health-giving exercises.

I cannot complete this chapter without an "appreciation" of the work of an elderly lady who was principal of the public school in New York City, where I did my first work as medical school inspector. I was of the original corps of appointees, some six years ago. The work was at that time new and not popular in every school. This gentlewoman, upon my first call, informed me that she saw no occasion for my presence there. For many years her teachers had been instructed to bring to her ailing children, whom she had at once sent home. There were no children for me to see that day; and I left

feeling that I really had no business at large. When I came next day she showed me a child that was not ill, so far as I could see. I explained I wanted to see only children who were possibly suffering from infectious diseases. Well, its father was an alcoholic, "and wasn't that catching?" she wanted to know.

Within a few days, however, we got along beautifully. She recognized that my coming did not greatly disturb the school routine and discipline, and that I relieved her of responsibility; and I soon found reason to admire the work of this excellent and masterful teacher of little children.

Part of the training she inculcated was such drilling as is here set forth as being something new. I several times saw from the platform the exercises which were gone through with by the assembled children. These, my dear old friend had many years ago instituted in her schools; and they have been copied and used in other schools with great success. The children, even the smallest, pointed to the various parts of their bodies, naming them and their functions, all speaking in unison the while, and with delightful cadence: "I have two eyes, two ears, one nose, and one mouth; my eyes are made for seeing, my ears for hearing, my nose for smelling," and so on. And they went through various drills, standing erect, throwing their arms above their heads, backwards, outwards, and the like, with excellent co-ordinated precision.

And while "seeing New York," and perchance studying the Subway Tavern, the sociologist can do no better than to visit the public school near by, the destinies of which are controlled by Mr. Doty and his admirable assistant, Miss Hayes. The former of these is a terrifying man in appearance, with his hair brushed up and his piercing blue eye. No truant boy could meet that eye and live. But, bless you, for all that, there never was a softer-hearted man; nor one, I imagine, so easily taken in by a plaintive yarn. But the wonder of his school is this. It is in the Italian quarter, and most of the children are of ignorant parentage, who come for the first time, knowing not a word of English, or anything else than Italian. To make Americans of these children of six and upwards, to teach them the English language and through them to educate their parents,—does the reader know of any greater task, or one so unassumingly achieved?

And then that other school, in which I attended a reception the day before Christmas—how the principal at one point announced, "Children, Dr. Huber wishes you a Merry Christmas,"—how I thereupon began to remove my overcoat, preparatory to responding with a speech, while the principal, not seeing, went right on with the cere-

monies ; and how I sat down again foiled and blushing, to the unconcealed delight of the assemblage.

I cannot, myself a public-school boy, speak too highly of them, so admirable a part of our national life, conceived as they are in the spirit fundamental to our Constitution, educating so well those upon whom we must rely for the perpetuation of our institutions. Shame upon those spineless and cheap specimens who would decry our excellent public schools—'twas not for such as these our fathers fought and bled !

CHAPTER VII

THE ADOLESCENT AND THE ADULT

“The prudent man foreseeth the evil and hideth himself. The simple pass on and are punished.”

THE adolescent period is a constant source of predisposition, not only to tuberculosis but to disease in general. We have noted that consumption begins to manifest itself with deplorable frequency about the fifteenth year. With puberty comes an oftentimes radical mental and physical transformation. So that the boy or girl, if not carefully watched, may deviate from even the most perfect health to a well-nigh permanent tendency to disease. Especially is this so with the feminine organism, unable at this time as it so frequently is to bear anything that would interrupt or interfere with its activity. The generative organs undergo great changes, and with these changes the whole moral and physical nature is altered. Perversions of any organ or faculty may then evidence themselves; and once started are apt to continue. Then other factors, such as constipation, want of sleep and excessive work at school, assist in establishing literally a permanent predisposition. Thus are developed the list of affections which are included in the generic name hysteria. Among the purely physical affections are chlorosis (green sickness) and anæmia (in which the condition of the blood is abnormal). And under such circumstances tuberculosis, especially of the lungs, is a matter of easy development. Here again we recall that consumption is more common at, and shortly after, the years of puberty than in previous years.

This same period of puberty is also, with regard to boys, of most difficult management, especially with regard to the sexual appetite, and it is not made any less so by many advisers, who are presumably well-intentioned. The boy needs most desperately to have his mind directed. The working boy is safe in the daytime; in the evening night-schools or wholesome amusements may engage him; and if he is tired enough to go to sleep at once on retiring, it is well with him. On Sunday afternoons, debarred through theological influences, libraries and museums are generally closed to him; wholesome amusements (after morning church hours) such as obtain in continental cities, are denied him; baseball and other manly and splendid sports

are not permitted the boy who has no time for play during the week. Thus do he and his fellows group themselves about alleys, street corners and congested thoroughfares and get themselves suggestioned in all sorts of baneful ways.

The boys of the better-off, who go to high-school and college, exercise sufficiently; and here the wise provision of college athletics comes into play, keeping the minds of the young men free from enervating impressions (Coughlin).

Sexual abnormality, as also perversions of all the appetites, is subversive of nervous and circulatory tone; it is depressive of the functions of the organism; it incites to structural affections. As every physician knows, the adjustment of this matter is extraordinarily difficult; and it is made no less so by such as are bigoted or stupidly inexperienced in dealing with the real conditions.

The excessive use of cigarettes among boys and young men is certainly predisposing to consumption; for tobacco is an irritant of the mucous membranes, rendering them dry and inviting catarrhs. Inhalation is especially pernicious, not only because of the hot smoke but also in the deterioration in the quality of the air thus produced.

I should strongly advise young men in business to join militia regiments. It is amazing the amount of health, both physical and moral, to be got out of such service. Of course, this suggestion is for the physically fit, not for the tuberculous; even if such cases were not excluded in advance by the regimental surgeon, strenuous exercises of the sort here executed are not for the latter. Let the young men go into a good regiment. From the very beginning there is a superb sense of well being. He is introduced to an admirable system of calisthenics. He assumes the position of a soldier, and perhaps for the first time in his life enjoys a delicious sense of physical symmetry and completeness. For at least an hour and a half—the length of a drill—he stands very straight, his shoulders thrown back, his lungs expanding fully, his head erect, chin up and eyes to the front. His movements are timed and measured; and he enjoys the mental rest of doing implicitly what he is told, and of having some one else for the time being do his thinking for him. Here is an extraordinary satisfaction. There are exercises he has to take. Soon he is given a piece to carry, which seems to him to have the weight of a young pine-tree, and which at first he manipulates with the airy grace of a dancing bear balancing his staff. After the drill he goes home, bathes, sleeps soundly, and awakens with an appetite, a sense of physical well-being and a clearness of mind such as are perhaps entirely new and most

happy experiences with him. Besides, he becomes of a company of a hundred splendid fellows—sound, manly, wholesome men. Among such his mind and body have got to be right.

The weak-lunged, or he who is likely to be affected by the predisposing causes we have detailed, would do well to protect himself. To begin with, he should lead the physiological life. He should rise betimes, bathe well, eat slowly three meals of wholesome food daily; should be in the sun and the open air a great deal; should drink generously of water, at least between meals; should avoid dusty, damp, or foul air; should work only in rooms where there is fresh air; should go to bed early and sleep at least eight hours. He should wear all-wool underclothing the year round, thick in winter and thin in the summer. The night wear should be of wool, changed from that of the day, of course; woollen socks should be worn in bed if the feet are cold. Warm footwear and stout, watertight shoes, preferably with cork soles, should be worn. He had better let tobacco alone, and should take alcohol very moderately and never without a bite of food at the time of drinking. There should be fresh air for him, and lots of it. Some people seem to have an antipathy for this benefaction not unlike that of the tramp for soap and water. He is not to be one of these. Fresh air abounds over all the surface of God's earth, except in the houses which man has built. The people who pass their time out of doors know nothing of coughs and colds. Not fresh air but want of it is the cause of many diseases. It is nature's disinfectant; there is no better. Living outdoors enables one to digest coarser food and to do more work without fatigue than is possible indoors. Pure air means oxygen, and this means pure blood; and this in turn means well-balanced metabolism,—the conversion of oxygen and wholesome nutriment into healthy tissues, so that a virile body is the result.

Next to be considered is exercise, of which there are all sorts,—rowing, swimming, riding, golf, tennis, boxing, croquet (for those of feminine tendencies), walking, etc. Walking is my preference. I consider it the best of all exercises. Professor Blackie, after the many years since his work, "How to Get Strong," was first published, still extolled this exercise above all others. It is of all perhaps the most inexpensive. No paraphernalia. Don't you like it? Read Robert Louis Stevenson, who quotes Hazlett: "Give me the clear blue sky over my head and the green turf beneath my feet, a winding road before me, and a three hours' march, and then to thinking! And he must have a winding road, the epicure." Poor Stevenson—to have appreciated this, and yet not to have been able to enjoy it!

One crisp spring morning I stood on the veranda of a hotel at Lake Hopatcong. Near by was a German matron, rotund and of most pleasing features, her two children playing about her. Presently there came upon the breeze the rise and fall of men's voices, at first indistinct and then sufficient to hear the song :

“ Halli, hallo, halli, hallo,
Bei uns geht's immer, je länger, je schlimmer ;
Halli, hallo, halli, hallo,
Bei uns geht's immer a-so !”

And from the sound of the first note this good gentlewoman's face took on a glow and a suffusing of the eyes, until presently, with splendid swing, green sprigs in their Alpine hats, a body of men on a holiday marched out of the woods near by to the hotel steps.

Thoroughly to enjoy and to get the most good out of this exercise of walking, you must throw your shoulders back, and your chest out, head erect, lips closed ; no mouth-breathing ; make it a five-mile clip. Trolleying is excellent, too ; the way to do is to get off and walk whenever you come to a stretch of country that is especially enticing.

We ought to breathe through the nose. Subsidiary cavities are provided within this organ in which the air is filtered, warmed and moistened in its passage to the lungs ; otherwise, as in the pernicious habit of mouth-breathing, the air gets into the lungs cold, raw, and often dust-laden.

Usually men who work out of doors get all the exercise they need. But people who work in factories should get some fresh air in the evenings if they can't get it at any other time. Night air is not bad, as some people think,—although it is not as good as the air when the sun shines. “There is no other air for us to breathe at night but night air.” The housewife should make it a rule to go out of doors, walking or riding in street-cars, at least one hour every day.

The thing to remember about exercise is to stop when fatigued, no matter how much or how little has been taken. The phthical are especially prone to overexertion.

After exercise comes bathing. The skin has important functions ; it respire, secretes, and excretes. Therefore we should bathe well in order to keep the skin in as normal condition as possible. A cold sponge-bath to the waist on rising is, in addition to the advantages mentioned, a good tonic for weak lungs. If this is done the bath-room should be warm, and vigorous friction with a rough towel should follow. A cold bath in a chilly room would very likely occasion in a weak constitution shock, followed by depression. In such cases tepid water should be substituted for cold.

It is said our English brethren take cold tub-baths (at the temperature of running water) on rising, even on the coldest mornings. This practice is probably not so general as we are led to believe; no doubt it is indulged in only by eccentrics, of whom there are not a few on the tight little island. A Birmingham (England) physician advocates instead a tub-bath on rising at the temperature of the body (98.5° F.) in a bath-room at a temperature of about 70 degrees. This advice is surely rational and wholesome. The feeble might stand while taking a cold sponge-bath in a bath-tub in which there is very warm water up to the ankles.

We have dwelt upon the effects of inordinate alcoholism; it cannot be too greatly condemned with regard to tuberculosis. However, to those in health a moderate use of alcoholic drinks of good quality seems to be distinctly beneficial.

Tea, the tippie of women, may have perhaps as baneful effects as inordinate alcohol.¹ Catarrhs and other affections of the nose and throat must be cured. Otherwise the respiratory passage will be contracted, there will be oxygen-hunger, upon which will follow weak lungs and narrow, undeveloped chest. Enlarged tonsils, adenoids, nasal "spurs," and like mechanical obstructions must be removed.

Singing is excellent exercise to develop the lungs,—though, of course, not essential. If one does sing, and can at the same time maintain cordial relations with his neighbors, his lungs will be all the better for it. Among the German soldiery, there is, I understand, plenty of concerted singing on the march.

The weak-lunged should get into the habit of taking long breaths and of expanding the lungs freely; good results would follow the practice of the following gymnastics for five minutes three times a day, on rising, before eating at noon, and at bed-time (Savage):

It is very simple and no machine is required. First, any clothing that would interfere with the free expansion of the chest should be removed. We breathe about eighteen times a minute, men a little more slowly than women. The exercise consists simply in breathing more slowly than usual for five minutes. Let a man breathe ten times a minute or fifty times in five minutes, timing himself by the clock. And let a woman breathe twelve times a minute or sixty times in five minutes, timing herself by the clock. Long, deep breaths of fresh air must be taken. To do this, one must stand erect, soldier-wise, the shoulders thrown backward, the chest thrown out, and the

¹ A great specialist cures many of his cases of heart-disease in women "by requiring the tea-kettle to be taken from the stove."

arms pressed well against the side. Other gymnastics than these should be counselled by the physician or the physical trainer for each individual. It is quite essential that pure air should, if possible, reach the innermost recesses of the lungs. We must recall that breathing is not so much a matter of inspiration and expiration as it is a matter of the interdiffusion of gases. There are in the normal process three kinds of air,—the tidal air, which is exchanged in each breathing, the complemental air, which is forced out after deep inspiration, and residual air, which remains after the fullest expiration. Respiration really means the conveyance of oxygen to the furthest tissues of the body. Normal respiration is certainly essential to health. Feeble respiratory movements (in the thorax) react upon the general systemic condition. Breathing gymnastics will certainly remedy respiratory insufficiency. And in addition to their direct effect they will have an excellent influence upon the nervous system, especially of the young.

Of course, enough clothing must be worn to keep the body warm, but there must not be so much that it will constrict the chest and interfere with free respiratory movements. "Put your chest-protector on your feet" is an absurd way of stating it; but the meaning is that if the feet are kept warm and dry many a disease of the respiratory tract will be avoided. In order to complete the record I set forth the usual medical wail against the tightly-laced corset, tight neckwear, tight shoes, etc. I know that no woman will take these things into a moment's consideration. The adoption of the rainy-day skirt is recommended.

A few more points: The teeth and mouth should be scrupulously clean. Medicines should certainly not be taken except upon the physician's prescription,—\$62,000,000 is the annual price paid in these United States for patent medicines (no physician's prescription required, alack). I think the consumers of them were harmed inversely as the proprietors were benefited. During convalescence after enervating diseases—influenza, pneumonia, typhoid, especially after fevers—the patient should be very careful indeed. To rest before and after meals is essential to good digestion for those who are weak. Excitement should be avoided. When the choice can be made, one should live in a dry and sunny house, avoiding narrow and crowded streets. Take a vacation,—one day in every week. Finally, *don't neglect a cold.*

CHAPTER VIII

VACCINATION AGAINST TUBERCULOSIS

Benvolio—Take thou some new infection to the eye,
And the rank poison of the old will die.

ROMEO AND JULIET, Act I, Scene II.

The search for immunity from disease began in the early days of history. In fact, Galen used the flesh of the viper as an antivenene, while Mithridates fortified himself against disease by taking all the then known antidotes. He also experimented upon condemned criminals, and finally succeeded in rendering himself and them immune to snake-bite by taking the blood of animals which had been fed upon venomous snakes; Andromachus, physician in chief to Nero, as well as other notables, resorted to the same expedients. Finally, Dioscorides advised those bitten by mad dogs to drink the blood and eat of the liver of the animals which had bitten them.—WAINRIGHT.

WE have in general terms considered that as most of us do not contract consumption despite the great prevalence of the disease, there must be established in the unaffected some sort of natural or acquired immunity. The study of this condition of immunity has occasioned in the ambition of great physicians—Maragliano, von Behring, Trudeau, and many others—to find a means by which practically all of us may be rendered immune to this tuberculosis.

In this aspect tuberculosis may be likened to smallpox. No doubt there is in the minds of many a vague sense of disapproval regarding such efforts as are being made to find a serum by means of which people may be vaccinated against the former. These are reminded of the attitude toward Jenner's efforts with regard to smallpox. In his day this infection was regarded as an inherent humor which must come out in every man. As no one could escape it, it was better to have it, and be done with it. Anyway, Jenner had no business meddling with the course of nature,—it was downright sacrilege, as many an unrighteous fatalist declared. Against this and like reasoning it was difficult indeed to get established a procedure altogether unprecedented, such as vaccination. Yet to-day who outside an insane asylum can conceive a return by choice to ante-Jenner conditions, when smallpox decimated cities and towns, wiped villages entirely off the map, and left every other survivor hideously pock-marked! No doubt a sentiment against vaccination for tuberculosis will exist for generations; but it is conceivable that the efforts of Maragliano and his colleagues,

and of their scientific descendants, will result in procedures which will make tuberculosis as rare as is smallpox. With regard to the infection itself, it needs no extraordinary spirit of prophecy to foresee such a result. Undoubtedly, however, no radical or universal extermination of the disease consumption can be hoped for until such powerful predisposing factors as poverty, alcoholism, and the like, can be done away with. If these conditions can be controlled tuberculosis will become in its plague aspects as much a memory as is smallpox.

Many observers have found that injections of serum from an immune animal into another have caused the destruction of bacilli introduced under the skin. Although the same test can obviously not be applied to man it has been found that the agglutinative power of the human blood (its power of arresting the motility of micro-organisms and of causing them to cohere in groups or masses) is raised by injections of serum from an immune animal into the system of a healthy man. From this it is reasonable to conclude that the defensive substances of the blood have been increased or fortified by the injection.

Maragliano considers that he has cured cases with an antitoxic serum which he has prepared, and that these cases have remained free from tuberculosis a number of years. It seems evident that such cases must have acquired an immunity to the disease; otherwise they would have been subject to relapse. The serum besides being injected has been introduced by the mouth into the digestive tract. Maragliano considers that immunization in this manner is possible, although there are some who hold that the defensive materials are altered and not assimilated in the alimentary canal. He has shown also that the protective elements of the serum pass into the milk; so that von Behring's idea would seem feasible of introducing the immunizing substance along with the milk of immune animals. These methods thus far considered constitute "passive immunization."

Active immunization is seen in clinical cases when the healing of local tuberculosis is followed by an increase of the defensive power as measured by the agglutinative property in the blood, and in which a second attack of tuberculosis does not occur. To secure this experimentally, material must be introduced which will secure the same reaction by the system as it exhibits against the living bacilli; but it is not necessary to introduce the bacilli, nor is it, of course, justifiable in human beings. After many trials and experiments Maragliano has prepared a material which, all danger of infection excluded, will cause, when inoculated under the skin, a tuberculous phlegmon. By means of these inoculations immunizing resources are undoubtedly established in animals. Such inoculations have resulted in the pro-

duction of antitoxic, bactericidal and agglutinating materials, so that animals have been immunized to the point of rendering them insensible to intravenous injections of virulent cultures which inevitably killed the controls (healthy animals which served as a standard of comparison). Finally, Maragliano has come to use these injections upon man, inoculating into the arm, at a point which soon presents a small circumscribed area of tuberculous ulcer, with suppuration that is entirely sterile. The temperature usually runs a fever course for two or three days, after which all manifestations disappear. The proof of immunization in these cases is derived from the increase of the agglutinating power.

Von Behring, whose discovery of the antitoxic serum used against diphtheria has resulted in the saving of so many precious young lives, has also been a factor in the evolution of an anti-tuberculosis serum. He has rendered calves immune to tuberculosis by the intravenous injection of dried cultures of the Koch bacilli. Sometimes one injection suffices to this end. Sometimes several are necessary. As a rule there is no marked reaction to these injections. And after long exposure to tuberculosis (even after the injection of virulent tubercle bacilli) when they are killed their bodies show that they are free from the disease, while control animals become infected. As with Maragliano these phenomena are found to be based upon an increased agglutinative power of the blood resulting from the injections. Von Behring has found that while calves show no marked reaction against these injections of dried cultures, older animals sometimes react in such a way as to endanger their lives, contracting as they do pulmonary congestion and œdema and sometimes pneumonia. Therefore, for immunizing purposes, von Behring chooses young calves. He is not yet ready to apply his method to human beings, but he believes that the time will come when the human race can be protected by these inoculations and an efficient means be obtained for extinguishing this disease.¹

The greatest danger to calves is from infection while very young. This is also the case with the infant, from living in the same room with persons afflicted with consumption, from impure food, and the like. Another analogous observation is that calves infected by the presence of tuberculous cattle in the same stable may not reach the expression of the infection in pronounced tuberculosis for years.

Von Behring has undertaken experiments concerning the possibility of immunization by the milk of immunized cows, but these are

¹ Billings and von Behring.

as yet incomplete and afford no data upon which definite observations can be based.

Trudeau has made many valuable experiments with regard to immunity. He has used as his agent a living culture of the Koch bacillus, which had become much attenuated by long cultivation upon artificial media. This culture had been obtained by Trudeau twelve years before, directly from a consumptive, and had then been passed through a rabbit, and was from that time grown on artificial media, chiefly glycerin-peptone bouillon. The culture finally came to grow more rapidly, showing no marked change, however; and it was just as effective at the end as it was originally. It showed a gradually diminishing virulence for guinea-pigs, and after the first six years, in ordinary doses, it did not kill rabbits, and in guinea-pigs produced only very slow lesions, or in other cases did not kill the animals at all. Trudeau administered increasing doses of this material to healthy guinea-pigs, and subsequently inoculating these animals with a virulent culture of it, was able to demonstrate a distinct difference between the lesions produced in these animals and in control animals, which had not been immunized, and to which the same doses of the virulent material were given. In general, in the immunized animals the lesions at first appeared to be more extensive than in the non-immunized, but subsequently the former showed retrograde changes, while in the latter the lesions advanced steadily in the usual way until they were fatal.

Trudeau differentiates very definitely toxic and bacterial immunity. A certain degree of toxic immunity can be produced, he considers, but not sufficient to protect animals against inoculation with living virulent bacilli. He could accustom his animals by gradually increasing doses to bear with impunity amounts of toxic products of the tubercle bacillus which at first would have proved fatal. But this toxic immunization did not protect the animal against the invasion of its tissues by living virulent bacilli when subsequently inoculated. It was only when he began to use living cultures as a protective inoculation that he met with such results as indicated that the living germ is essential to what success has been attained in the production of artificial immunity. He inoculated living bird tubercle bacilli in rabbits, and secured a marked degree of artificial immunity. In these rabbits, which had previously received the preventive injections of living bird bacilli, the virulent inoculation at first gave rise to a violent reaction of the tissues, which ended generally in cure, while the tuberculous process, similarly induced in the controls, was steadily progressive, though at first it was accompanied by little or no local reaction.

The works of these men and of Koch, Thomassen, de Schweinitz, McFadyean, Pierson, Gilliland, Neufeld, and very many others, will surely result eventually in definite procedures which it requires no great spirit of prophecy to foretell will alleviate human suffering perhaps more than any other single agency since the world began. Maragliano declares that his system of vaccination has even now been perfected to the degree that it is absolutely innocuous. It could be practised in families where tuberculosis is prevalent, in factories, and in infected centres, such as the "lung block." "Since milk, the blood serum, the blood, and probably also the flesh of immune animals can furnish the human organism with elements of resistance against tuberculosis, why should not these be used as food and furnish along with the normal nutritive material immunizing material? Why, instead of ordinary milk, should we not use the milk of an immune cow? Why, instead of ordinary meat, should we not eat the flesh of immune animals?"

With regard to other diseases, as smallpox and diphtheria, immunizing measures are now a matter of course; and in their accomplishment laboratories, health departments, scientific institutions, and great business enterprises are working together upon a rational scientific basis. No doubt tuberculosis will ultimately be dealt with in the same way.

"Antistreptococcus sera" are really a curative rather than a preventive agent. We have found that as the disease tuberculosis progresses various forms of cocci aid the Koch bacillus in its pathogenic work. It is the admixture of these cocci which results in virulent types of the disease. And the Koch tuberculin would no doubt be curative if it had the tubercle bacilli alone to contend with. There are various sera directed against these cocci, to be used later in consumption, and some physicians have reported very favorable results which they attribute to their use (Bonney).

Part VII

THE CURE

The essentials in the home treatment of consumption in small towns, country places, and suburbs of large cities, are :

1. The confidence of the patient.
2. The masterful management on the part of the doctor.
3. Persistence—benefit is usually a matter of months, complete arrest a matter of years, absolute cure a matter of many years.
4. Sunshine by day ; fresh air by night.
5. Rest while there is fever.
6. Bread-stuffs, and milk, meat, and eggs.

OSLER

CHAPTER I

THE PHYSICIAN AND THE PATIENT

Then give place to the physician.—ECCLESIASTICUS.

“The best occupation for a patient is to labor to get well.”

THE physician will take every possible means to establish an early diagnosis, recognizing the gravity of the disease, and the fact that with each day's delay in treatment the patient's chances of regaining health are progressively jeopardized. He must be a masterful man, dominating the situation. Knowing that benefit is a matter of months, arrest of years, cure of many years, he will map out the course accordingly. His will be the generalship, the recognition of the many elements to be considered, and the material at hand with which the disease may be combated. The patient must be made to rest confidently upon his strength and his judgment; and the patient's mind must become permeated with trust in his latent resourcefulness. His consultations must always and unfailingly be an inspiration.

There must be something of a subconscious bond or compact to which sympathy will be the contribution of the physician and obedience that of the patient. The latter, particularly in this disease, is weak and lacking in reserve energy. He will need support and suggestion of health and vigor, not only when he knows he needs these things, but even more so when he imagines he does not,—like many who need to pray, not so much when they are unfortunate as when they are becoming prosperous. The physician will study the mental condition of the patient; he will recognize that in many such, especially women, the emotions and the will are apt to be unstable. He will deal severely with frivolity; will encourage the despondent; will with great and redundant patience instruct the ignorant. His directions must be clear and definite; concerning them the patient must never be left in doubt. It is essential that he shall explain the nature of the disease to the patient. It is criminal to speak mildly of an “apical” or of a pulmonary catarrh, and soothe the feelings of the patient, with the result that the latter may, through not understanding the gravity of the disease, neglect herself, with fatal results. It will not be agreeable for the physician to know that a consumptive has said of him in the last weeks of her life: “If Dr. X. had but told me the truth, I might have been well to-day.” For such an evasive diagnosis as this

no consumptive will observe the rigid regimen essential to recovery, especially in the case of a man; nor will such an one renounce his favorite habits and pleasures; nor his vocation, if needs be; nor his time and money to achieve his cure; nor will he leave, if called upon to do so, his own people and his familiars.

The diagnosis of consumption, if made early, is not discouraging; it is not now, as it used to be, equivalent to a death-sentence; in all human probability the conscientious and obedient patient, who has the disease in its incipiency, will get well. And this will be so, moreover, in many cases of fairly advanced disease.

Upon being told of his malady the patient may become dreadfully affected; and here enormous tact is required on the part of the physician. The patient will look him anxiously in the face, and he must compose his features to a clear-eyed, calm and gentle sympathy, and his voice must be both firm and kindly while he is meeting the patient's quivering lips, the white, tense, dilated nostrils, and the swimming eyes, over which he presently puts his trembling fingers.

However, following upon this initial shock, the psychology of the patient is almost invariably that of the volunteer soldier. When the idea of going into battle first confronts the latter, he will have a sense of terror no matter how established his courage may be; but presently this emotion will certainly give way to that of exultation and of a belief in ultimate victory in the fight which must be made.

The patient must be obedient to his physician, and persistent in every detail of the treatment enjoined upon him. He will be confident of his recovery,—a state of mind happily prevalent among consumptives; for such patients are proverbially sanguine and optimistic. He must understand that his improvement and final recovery will depend largely upon his own conduct. He must consider, before he undertakes any business or other matter, how his chances of getting well will be affected thereby. He must make it a habit to converse with no one except his physician or his nurse concerning his disease; nor will he adopt the therapeutic suggestions of his solicitous friends. If he have lost faith in his physician or his nurse let him straightway get another. However well he may consider himself he must continue under his physician's observation until he is dismissed.

CHAPTER II

FUNDAMENTAL PRINCIPLES

Pathological anatomy has never perhaps given any more decided proof of the cure of a disease than it gives in cases of pulmonary tuberculosis.

WE consider here the general principles upon which are founded the cure of this disease. The layman who reads this book must, if he has occasion, consult his own physician for details; the medical reader is referred to appropriate chapters for scientific essentials.

The first practical consideration will be the disposition of the infective material; this we have dwelt upon. Then the consumptive will keep away from others who are suffering from such infectious diseases as diphtheria or scarlet fever; for an admixture of the germs of these diseases with that of tuberculosis results in the mixed infection which renders fatal so many cases of the latter. The consumptive patient will be careful not to reinfect himself, to which end he must associate intimately as little as may be with other sufferers.

As regards others he will observe the golden rule, and must take the greatest care not to infect his fellows. It were well for him not to work in dairies or about cattle, nor should he prepare or otherwise handle foods.

The next consideration is that of rest, at least during fever. He must not endure the slightest fatigue or overexertion. To the end that he may rest well the home in which he lives shall be fit and comfortable. His bedroom should be the largest, sunniest, and best ventilated in the house. Carpets and curtains should be as scarce as possible compatible with the æsthetic sense. I shall here sketch a specimen room which I saw at the Baltimore Exposition. Its æsthetic and very wholesome appearance appealed even to my unemotional masculine eyes. Its floor was of hard wood, and there were just rugs enough to give an appearance of comfort. There was a Morris chair, well-cushioned; also cane-bottomed chairs; a dressing-table, neatly covered with thin, clean linen, upon which were placed "frizzing," appliances for "doing up" the back hair, and other mysterious paraphernalia essential to the feminine toilet; a sofa with pillows (none of them plush); a brass bedstead, over which by means of a stand was a tray with dishes containing an appetizing meal; a small stand by the bed, having upon it a book, clock, etc.; a scrap-basket, a washstand, with tooth- and nail-brushes, a mouth-wash, a thermometer

resting in a glass upon clean absorbent cotton, towels, etc., and a few simple pictures of a restful character, such as represented landscapes, sheep, and the like. There was in this room no such cheerless abomination as antiseptic furniture.

The aspect of the room should be to the south, if possible; it should be large and easily ventilated, and as far as may be from the other rooms without producing a sense of isolation or of disturbing the home relations or the play of the family affections. The bed should be at least a foot from the wall. The temperature will be 60°, and windows will to this end be open constantly. The patient

will not remain within several feet of a radiator or a hot-air register; he must not breathe hot air.

Rest should be out of doors as much as possible. When the air is cold the patient may wear warm headgear; he may be wrapped comfortably in abundant clothing or sleeping-bags, with hot-water bags or bottles, or hot bricks wrapped in strong paper for the feet. Emaciated patients may sit upon rubber-rings or cotton or oakum pads, covered with gauze, such as may be easily destroyed. Porches, verandas, fire-escapes,¹ yards, the roofs of houses, may all be utilized in this way. Morris chairs, or steamer chairs, or small cots may be used, with screens or



FIG. 39.—Courtesy of Dr. J. W. Brannan, and the *New York Medical News*.

tent-covers to keep off snow and wind. Patients may rest in gardens during many hours. They may walk to parks or they may be taken thither in hand carriages or wheel chairs.

The next principle of treatment is that the patient shall every possible moment breathe fresh air and be in the sunshine. Among the many blessings which pure air confers are the rest and repose it induces and the ravenous appetite it occasions, which makes possible the abundant feeding essential to recovery. No atom of oxygen, the life-giving gas, should be lost. If I were a poet, "which I'm not," I should certainly write a poem in praise of oxygen. The theme is

¹ "Tell it not in Gath"; for 'tis a violation of the law to encumber fire-escapes.

an inspiring one. This, the life-bestowing, the life-maintaining gas, is the most useful and the most abundant of all the elements (as we still call them). Its combination with other substances — oxidation — makes heat, and that is why the sentient body is generally warmer than the atmosphere. All animal and vegetable life depends upon oxygen. Under the sun's benignant influence, plants give out this gas, which thus freed is respired in animal life. The capillaries carry it to the uttermost cell in the organism, giving power and warmth and health,—in fact, life itself. It is more important than food to the economy. Without the latter one may exist for months; without the former one dies within a few minutes. Oxygen has a tonic effect upon the system. It dilates the air vesicles, increases chest expansion, gives greater lung capacity, accelerates the blood-flow and equalizes the circulation throughout the body. The tendency to local stasis in the lungs is thus avoided.

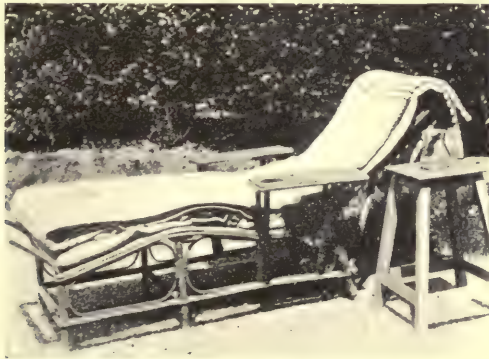


FIG. 40.—Couch in a garden.

Pure air and the blessed sunshine,—the tubercle bacillus cannot withstand these. Scientific data would seem superfluous here. Still one may note that a high temperature used to be maintained in the houses in English zoological gardens of certain animals from the tropics. Now they let these animals go out even in winter into the fresh air, and the mortality is considerably less. Hillier states that among closely confined milch cows tuberculosis is principally found; among cows kept in the open air in Jersey tuberculosis scarcely exists. The well-fed stalled ox is more liable than his fellow fed on a half-starvation diet on the barren moorland. Tuberculosis is rare among sheep, which are practically never housed.

Consumptives should be in the fresh air “twenty-four hours out of the twenty-four.” The day air is better for them when the sun is

shining, but the night air is good, and it has the advantage, in cities at least, of being freer from irritating particles.

As regards the value of pure air read the eloquent testimony of the physician, Daremberg, who was himself a consumptive :

“No one knows the happiness of the consumptive who quits his tainted chamber to live *au grand air* if he has not himself experienced the benefits of this change. After having passed several months between the four walls of a small room in Paris I arrived on the French Mediterranean coast, and, after the advice of Henri Bennet, I stretched myself out all day in the sun. At night I lay with my windows open. As Voltaire says, ‘The hope of recovery is already half a recovery.’ Soon my powers revived. I could walk, make short excursions, find pleasure in existence. I discovered that the sun of my life had not yet set. I saw it rise each morning with delight, and each day linger too short a time to allow me to enjoy to the full the pure air, the bright light, the blue sea, the heavens, the earth—everything. It is good to feel one’s self reborn.

“This life in pure air, night and day, stimulates the appetite, improves the digestion, suppresses the



FIG. 41.—The “Aerarium.” A practical method of sleeping outdoors. Put the head of a cot bed through window and protect by a long double awning so arranged as to keep up a rising current of air without draught. This plan is to be followed only upon the physician’s advice. (Courtesy of the Lapalme-Hoffman Co., Waterbury, Conn.)

fits of coughing, facilitates expectoration and the respiratory movements, invites calm sleep, and when the consumptive has an excess of evening temperature, that excess passes almost unperceived by him. Generally both fever and sweats gradually disappear.”

Some years ago a poor man came to me,—a worker upon a cement boat that made trips to the city from up the Hudson. There was irrepressible spirit in him—and there still is, I am glad to say—and much *bonhomme* and love of life. Every time I saw him he declared himself better,—which I knew he was not. His was a classic case of the disease; and all the symptoms were aggravated by such factors as the cement dust he had to inhale and the heaviness of the barrels he had to lift. While under my care he was getting progress-

ively worse, until one night I was called to go to him. From the foot of a street on the East River, to which I was directed, I leaped in the darkness from boat to boat until I reached the cabin in which he lay,—a small canal-boat cabin, the windows of which were sedulously closed. The air baffled adequate description. There were several men playing poker; they had just eaten a meal of steak and onions; they were smoking villainous tobacco; I think there was an odor of bad whiskey, but I could not definitely isolate it. I could, however, distinguish that of creosote which my patient exhaled while lying in his bunk. (In those days not to prescribe creosote was tantamount to malpractice.) I realized at once that my patient must inevitably die if something radical was not done.

So I had him thereafter sleep under the stars, no matter what the condition of the weather might be. His head should be protected, his body well covered, and his feet warmed in intensely cold weather. Clothes-horses and other contrivances should screen him against snow and bitter winds. Awnings should protect him against rains. Never again should he sleep in that cabin. These rules he obeyed. He sees me now occasionally. Certainly his disease is arrested; and it seems likely that he will, in very fair health, attain a goodly age. His associates bear me a grudge. They wish I had let him alone. As things are now



FIG. 42.—Side view of Aerarium. (The Larpalme-Hoffman Co., Waterbury, Conn.)

they are out of pocket by his prolonged existence, for he is the best poker-player among them, can sit longest at the game, and has, in the long run, appropriated a large proportion of their earnings.

Another case is that of a young woman who made getting well the business of her life, for the time being. She had her cot put on a porch outside the house. An umbrella, securely fastened, protected her head whenever it snowed, and it happened from time to time that when she awakened her blanket would be covered with the night's snow-fall. These cases are not now unusual.

While many people in health are "hugging fires" consumptives walk or ride, if possible; or they recline, wrapped up and sheltered,

of course, in the open air, during as many hours as may be, through all changes of temperature, fearing neither rain, sleet, nor snow. The rain, however, they had best avoid. If the patient is so ill that he cannot be out of doors, his bed is drawn close to the wide-open windows. Weak patients should be wheeled out into the air directly from their rooms. To this end it might be possible in many houses to cut down the window to the level of the porch or of an outside platform. When indoors, day or night, the consumptive's windows should be freely opened. Such treatment never has untoward results. The head should be well covered; the feet should be warmed if necessary. In warm weather the head and shoulders must not be kept in

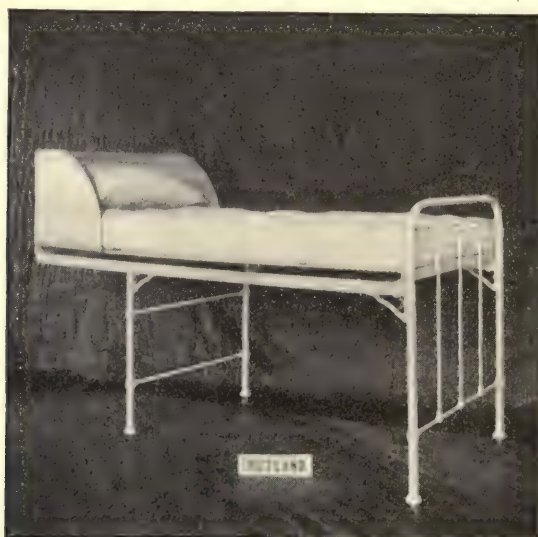


FIG. 43.—Dr. Dunham's bed. Showing how head may project out of window. This plan is to be followed only upon the physician's advice.

the direct rays of the sun. Sun-baths—the nude body being exposed to the direct or concentrated rays of the sun—must be taken with caution and only by the physician's instruction. High temperatures may thus be induced.

An important rôle is not now assigned to any particular climate in the treatment of consumption. Patients are not sent thousands of miles to get well, as used to be the case. It has been found that almost any salubrious climate will be effective. In one respect a change from a low altitude to a very high one is unfortunate, in that the patient must oftentimes for the remainder of his days live in the latter climate, the rarefied air of which induces a "physiological emphy-

sema." The consumptive who does not do as well as he would like is apt to change his climate frequently. There is always distress during the travelling, which is, moreover, positively dangerous when there are cavities and a propensity to hemorrhage. In any event the patient must rest well at home for a few weeks before attempting any journey; nor will he go to any place without definite information concerning it, or of the certainty of finding accommodations.

After oxygen comes the necessity of plenty of nutritious food-stuffs, and of good digestion, so that *all* the fuel that is taken in may be assimilated and converted into healthy, germ-resisting tissues. Details concerning diet will be decided upon in individual cases. In general terms it should be such as will give the largest amount of nutrition with the smallest amount of labor for the alimentary tract,—roasted or broiled beef, mutton, lamb, fresh vegetables and fruits, cereals mixed liberally with cream, koumiss, plenty of sugar and good butter; and at or between meals six or more eggs and from one to three quarts of milk distributed through the twenty-four hours. Indigestible things, such as sweets, pastries, dainties, must be avoided; these interfere with normal metabolism,—a perfect change of oxygen, fluids, and food into tissue. Between meals, at any rate, plenty of water will be drunk. There should be half an hour's rest on a bed or reclining chair before and after the principal meal, at least; nor must the patient eat when in a state of nervous excitement.

Lack of food or wretched food, and irregularity in feeding,—these factors are enormously predisposing to consumption among the poor. Then many things are dreadfully cooked; to this fact many experienced nurses testify.

I hesitate to mention the use of alcohol. In certain cases, concerning which the physician must decide when he knows the temperament of his patient and that obedience can be assured, small amounts of alcohol, in wines, or egg-nogg, or sherry and egg, etc., will be found beneficial. To give free rein to alcohol will surely be disastrous.

As regards medicines: Let no patient use any without his physician's directions. There are certain serums which physicians may administer by injection or otherwise with good results. Beyond these there is at the present time no specific which will cure consumption. One of the saddest pages in medical history is that upon which is written the deaths of consumptives who need not have died, but who became progressively worse upon sure-cures, such as had been advised by solicitous friends, or had been testified to in vicious advertisements. Patent medicines, of which the formulæ are not distinctly given, should not be taken by consumptives. Many of these have alcohol as a basis,

and thus give a sadly fictitious and temporary sense of well being; they bring relief one day, relapse the next—and progressive decline.¹

Not more reprehensible, on the other hand, are the counsels of Dowieites, “faith-curists,” Christian scientists, and the like, who would have the consumptive disregard his disease as a figment of the imagination. These imposters go about unwhipped of justice for much suffering, much family bereavement, many deaths that have come about through their baneful counsels, born of complacent ignorance, of all stupidity most execrable.

Many consumptives need medicines. Their various organic functions have to be regulated according to the individual necessity, and the complex relations of the tissues and organs. In one case the kidneys need a medicament, in another the circulation, in another the nervous system, in another the stomach. It was Henry Ward Beecher who declared that near by many a grave are vegetable and mineral substances the virtues of which, if they had been rightly used, would have deferred the occupant’s burial. This is good sense and good science, according, as I think, with the facts of life which are presented in the opening chapters of this book.²

It must be evident, upon reflection, that drugs are a means of cure as essential and as divinely appointed as any other agency for restoring health. They have certainly—as much as anything is certain—been put in nature to be studied and used intelligently; and medical science has systematized and formulated the world’s accumulated knowledge of them. But it is absolutely necessary that, in tuberculosis at least, they shall not be used haphazard. The uses of them are matters which lie wholly within the physician’s province,—particularly as regards this disease. Especially must any drug which spoils the appetite or the digestion be discontinued.

We are now in a position to count upon the thumb and fingers of one hand the fundamental principles in the treatment of consumption:

- (1.) The disposition of the infective material.
- (2.) Rest.
- (3.) Fresh air and sunshine.
- (4.) Pure food and drink in abundance.
- (5.) The use of medicines as directed by the physician.

¹ Appendix B.

²The “thousand-souled” understood well such facts as these, as we may judge from the Friar’s speech in *Romeo and Juliet*. Shakespeare might, by the way, have supplied the evolutionists with one of their chief tenets,—that life is the constant adjustment of internal relations to external relations.

CHAPTER III

OTHER CONSIDERATIONS

It is impossible to extirpate all tubercle-bacilli, therefore it is indispensable so to strengthen and harden the body that the absorbed germs cannot take hold upon it.—*Imperial Board of Health of Germany.*

THE subject of the sexual tendency with regard to tuberculosis is as important for the physician to consider as it is difficult to discuss. We need but allude to it here. Obviously in the management of consumption every element which would tend to weaken the system should be eliminated so far as possible. The Scriptural statement that "he who thinketh in his heart" upon sexual things hath already committed the equivalent at least of a sexual act is figurative in a sense; nevertheless, it is practically quite as true as if there had been physical consummation. For the mere thought itself has led to the secretion of physical elements, with the result that the system has become impoverished to the extent of this abstraction from its tissues. This is why, conversely, Sir Galahad's strength was as the strength of ten.

The consumptive is rather more prone to sexual excitement than the average normal individual. Many things occur to one in explanation of this: the lack of occupation; the many hours passed in enforced idleness; the nervous tension and the general excitement under which many consumptives labor; the erethism which may be induced by the high temperature and the influence of the tubercular toxins within the body; the superabundant sense of well-being which the forced feeding induces; in many cases the feeling that the disease is likely to be fatal, and that life might as well be enjoyed to the limit while it lasts, and like considerations. With regard to these matters the physician will see that susceptible patients have as few opportunities for isolation as possible.

Judicious bathing is exceedingly important in the cure of consumption. Upon general principles a daily sponge on rising, at least to the waist, with a brisk rubbing afterwards, is essential. The bath-room should be warm. The temperature of the water should not make one chilly. It may begin with 95° or 90° Fahr., and may be gradually reduced until a lukewarm or cold bath may be taken with comfort. By this time perhaps a cold shower could be endured. A coarse towel should be used vigorously,—by an attendant, if possible. There

should be some rest after the bath, from fifteen minutes to half an hour. Weekly there should be a warm bath, with thorough cleansing of the body; where there is much sweating this bath should be taken twice a week.

The scientific advantages of bathing are to enrich impoverished blood elements; to deepen inspiration; to enhance nutrition; to further metabolism; to eliminate excreta; to obviate blood stasis; to reduce temperature; to bring about a sense of mental as well as physical well-being.

In hæmoptysis baths should be omitted (certainly the daily ones). While the patient is lying down the various parts of the body should be cleansed and rubbed in succession. When also there is pleurisy, or after a night-sweat, or when the temperature is below 97° , a dry rub should be used judiciously, instead of a bath. And during fever the bath is best taken in the afternoon rather than in the morning.¹

It is very essential that the consumptive should have his exercises graduated by his physician; especially is this so of lung gymnastics. Concerning prophylactic exercises we have dealt in another chapter. We note here that certain judicious exercises will expand the lungs and increase much needed air-space.

Indications against exercising are subnormal temperature, one degree below; fever, no exercise at all if the temperature is 100° F., and bed inexorably if the degree is 101° F.; rapid pulse and a tumultuous heart; weight much below par; far advanced disease; fatigue or shortness of breath upon exertion; or when there is blood in the sputum. The physician will not permit exercise where there is a far-advanced cavity, or a dilated right ventricle. In consumption the organism is often on the verge of bankruptcy, and may be "easily bankrupted by an excessive amount of physical exercise." Again, "excessive muscular action consumes energy and throws products of combustion into the circulation" (Flick). In all such circumstances as these rest is essential; exercise may prove fatal.

When respiratory exercises are required of the patient, the physician will, of course, see that there are no hypertrophies, exostoses, or obstructions to free respiration. The man or woman who must work will take every possible chance to rest; there should be no running or lifting of heavy weights; stooping should be avoided.

The patient's clothing should not constrict his neck or chest; it should not impede respiration. He should not wear constantly enough clothing to keep his skin moist with perspiration. Overcoats

¹Appendix C.

and wraps are to be used for outdoors ; the underclothing should be woollen all the year round,—thick in the winter, of light weight in the summer ; or in winter wool or silk may be used, and in summer silk, or silk and linen, or silk and cotton.

Sleep, nature's soft nurse, is perhaps of all medicaments the best, if it be taken warmly covered at the temperature of the air without the house. In the country one had best go to bed very early in order to finish sleep (nine hours of it, if possible) before sunrise. Then he may bask in the early sunbeams and lie listening for an hour to the lark and the bobolink. If he can, he had best build a wren's nest within sight of his bed, so that he may be encouraged by the abounding song and the pulsating joy of life which this splendid little optimist manifests. If in the city, on the other hand, he must not sleep or live in dark rooms opening on shafts, or in basements.

Tobacco is irritating to mucous membranes ; probably no catarrh has ever been cured in an inveterate smoker. Tobacco throats are certainly predisposed to infection. The weed should be used as little as possible. However, in many cases where the habit is essential to comfortable living, and has been practically lifelong, it must be condoned ; it must then be confined to moderate limit. Smoke must not be inhaled. Cigars and pipes are less harmful than cigarettes.

Cough is nature's effort to get rid of deleterious matter. Nevertheless one should cough as little as possible, especially at meals ; and as far as may be only in order to expectorate the products of inflammation ; he should invariably in coughing and sneezing turn aside his head and hold a handkerchief before his face. Sometimes talking increases the coughing ; this suggestion is offered only to men, who, of course, only stand in need of it. Should there be a hemorrhage, the patient should lie very quietly until a physician arrives.

The consumptive should avoid crowds, smoke, irritating vapors, dust, and dampness. His house should be built not upon damp, clayey soil, but upon porous, gravelly, elevated dry soil, or a slope, if possible, with a southerly exposure.

Part VIII

THE MEANS OF CURE

C'est dans le pouvoir humain de faire disparaître du monde tous les maladies parasitaires.

PASTEUR

CHAPTER I

TENTS AND OTHER OUTDOOR STRUCTURES

Let us go out into the sunshine.—D'ANNUNCIO.

TENT-LIFE assures the maximum of fresh air and sunshine; and, because of its comparative cheapness, is more available for the vast majority of consumptives than permanent and more solid structures, particularly as the latter are at present very few and have hopelessly inadequate accommodations for these sufferers. Besides, it has been found that many patients really do better in tents than in the wards of buildings. Those who keep their fever while sleeping indoors are prone to be without it when the night as well as the day is spent in the open air.

I can here but outline the features of some among the many excellent devices for the outdoor treatment of consumption, referring the reader to Appendix E for details of construction and cost.

Tent-life is the method which will first be pursued by communities to segregate their consumptive poor and afford them rational and enlightened treatment, or for charitable associations having these ends in view.¹

If possible, when many patients are to be taken care of, there should be a central administration building for dining, etc., and for the housing of advanced cases, which would be in the midst of a tent colony.

In tent construction certain things have always to be kept in view. The ordinary rain-proof canvas tent is also air-proof,—so that sides, ends, and roof must be kept open, except when rain or snow or heavy winds have to be excluded. “The tent without special care may become a hindrance instead of a help in the treatment of tuberculosis.” In the winter months there should, if possible, be some

¹ For the 30,000 consumptives in New York City there are available at present less than 2000 hospital or sanatorium beds; for the 22,000 of the State there are but 193 beds. “Since of this total of 193 beds, 118 are for local use only, in Buffalo, Rochester, and Westchester County, for the estimated 18,250 State cases outside of these three places, there were available 75 beds, or one bed for every 244 cases.”—(From the Charity Organization Society’s invaluable pamphlet on “City and Country Care of Consumptives. Some Methods of Housing.”)

means of heating the tent while the patient is rising and retiring for the night. The patient's eyes should be protected from the glare of



FIG. 44.—Tent-life at Saranac Lake, New York.

light, which is a drawback of some tents. Good ventilation is essential; otherwise the tent is apt to become damp and cold in inclement weather.



FIG. 45.—Tent at Country Branch of the Rush Hospital for Consumptives, Philadelphia.

Professor Fisher, of Yale, became consumptive; and, not wishing to leave his work, he devised a tent for his own home use (Fig. 46.)

The neighbors thought him *non compos* for living in this tent. However, he got well, after which he presented his device to the State of Maryland, stipulating only that it should be used in the treatment of a like sufferer. Its floor is ten by fourteen feet and its walls are eight feet high under the eaves, from which rises a pitched roof to a central cupola. It is raised a yard above the ground, and is provided with a very ingenious system of ventilation.

The tent constructed by Dr. C. F. Gardiner is very extensively used in Western sanatoria. It is a modification of the Sibley Army tent, and is of a conical shape, the walls being arranged to unlace and turn back for airing, with vertical sides rising four feet above the ground. The board floor has an air space beneath, and air inlets protected by hinged doors so as to be opened or closed as desired. There is a ventilator



FIG. 46—Prof. Fisher's tent.

at the apex of the cone. All of the openings may be closed to heat temporarily the tent for rising or retiring. There is a sheet iron cylindrical stove, the pipe of which is carried above the top into the air. This tent has neither centre-pole, pegs, nor guy-ropes, and stands quite firm like a house. It is "not an experiment, but has been used now some six or seven years in various parts of the country, and found to be practical and efficient in the treatment of tubercular cases, its main feature being the automatic supply of outdoor air, with a proper degree of warmth to insure comfort in cold weather."

The Tucker tent (Figs. 48 and 49) is an individual structure used at the Association Health Farms of the Denver Young Men's Christian Association. Its ventilating features are excellent. Its cost is from seventy-five to one hundred dollars.

The tent devised by Dr. H. L. Ulrich is a simple and serviceable structure "within the reach of the poor man's purse and intelligence" and which may be put up in any yard or empty, unused lot. Its cost is about twenty dollars.

The sleeping-box devised by Dr. Millet, of Bridgewater, Mass., is a one-story structure, erected some distance above the ground. The entrance is through a door at one side, reached by a stairway. There is a large window on either side. The south end is open, closed only when necessary by a pulley-drawn curtain. The back of the box to the north is closed by two pairs of heavy wooden shutters swinging horizontally, the lower half of each pair hinged at the bottom and the upper hinged at the top so that this end can also be thrown completely open.

An Adirondack tent-house is described by Dr. Hermann M. Biggs. It is a simple, serviceable model, which can be used by three or four inmates during most of the year with perfect comfort. Its cost would be from one hundred and fifty to two hundred dollars; it is well-ventilated, and can be comfortably warmed in moderately cold weather by means of oil-stoves.



FIG. 47—Open-air shelter. (Hillier.)

At Muskoka there is a type of frame cottage with shingled roof and board floor, the walls being either board or canvas. A porch is built on the south side, practically all of which can be thrown open. The upper part of the interior is ventilated by means of small windows under the eaves. A ventilator opens from the roof. The room is heated by a small stove and lighted by electricity from the central plant.

The pavilion-tent, or the tent-cottage, a device of Dr. Holmes, of Denver, Col., is used in the Metropolitan Hospital on Blackwell's Island, New York. Twelve of these structures, accommodating one hundred

and forty-two patients, are an important feature of the institution's treatment. Various devices and improvements have made them "practically storm-proof and as comfortable in stormy weather as an ordinary building." A double circuit of steam-pipes around the side of the tent insures warmth in winter; in three of the more exposed of these tents stoves have been placed for additional heating.



FIG. 48.—The Tucker tent.

The temperature in these tents ranged between 20° and 30° F. most of the winter during both day and night. The women have lived in them at this temperature throughout the winter, improving in health and enjoying themselves. They were not compelled to sleep in these tents; there were always empty beds in the wards, and on several of the coldest nights a few of them went

inside, but the majority preferred to remain outside, and said so frequently. They were, of course, warmly dressed, having heavy flannel petticoats, mittens, hoods covering the head and neck, and were abundantly supplied with shawls, steamer-rugs and blankets. We shall see that these experiences are duplicated in the tuberculosis camp on Ward's Island.

Dr. H. B. Masten provides an ingenious arrangement for a tent sanatorium. The dimensions of the cottages are twelve by nine and a half feet with a height of ten feet. The side walls are built five feet from the ground with lumber and heavy building paper. The remainder of the frame is covered with twelve-ounce canvas. The door opening on the veranda has a large glass panel in its upper half. Above the veranda roof each cottage should have a transom, and this, together with a



FIG. 49.—The Tucker tent. (Interior.)

hinged window in the near wall, is always to be left open except when the patient is at toilet. This will provide plenty of ventilation, as it is difficult to make the air of a tent impure. The floors should

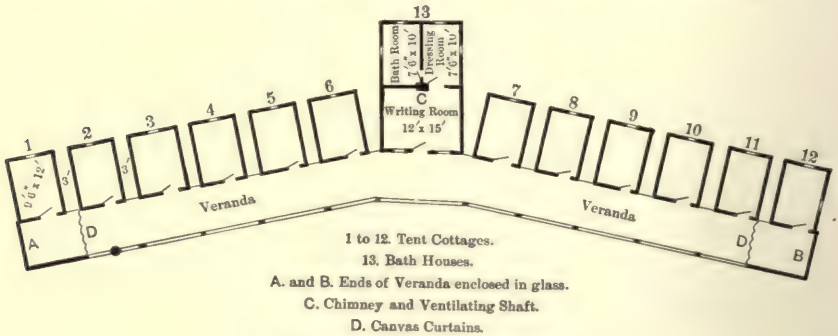


FIG. 50—Dr. H. B. Masten's tents.

be double, of hard pine, with a layer of paper between, and kept polished with a mixture of paraffin and turpentine. This prevents splintering and avoids all cracks, affording no place for the lodgement of germs. The interior should be painted in a soft green shade. The



FIG. 51—A Ducker tent-house.

furniture should consist of a single bed, dresser, mirror, two chairs, and a small table with a glass or marble top. Each cottage should have an electric bell connected with the main office. The bath-house should be built of brick, with hard-finished walls painted green.

The front half should consist of a writing-room, and the rear should contain the bath and dressing-rooms, together with various kinds of baths. The dressing-room should contain three lavatories, one to be used only for cleansing the teeth.

The sewage and the water from the bath-rooms is conducted to water-tight tanks, and the water disposed of by subsoil irrigation. The residue from the tanks is spread on the ground in the sun at a considerable distance from the building.

The Ducker Company, of New York City, have in answer to my request kindly sent me this picture, which is of a building seventeen by thirty-three feet. Twelve patients can be comfortably accommodated. The lower half of its sections is covered with wood clap-boards, and the upper half, including the gables, with canvas. Over the canvas roof, in which there are ventilators, is a large canvas fly. There are registers in the floor admitting a free circulation of air which passes out through the roof without draught. The windows on the sides and ends fall down into the casements below and the canvas awnings can be raised at any time, making the whole interior "like out of doors." The cost of the building approximates \$750.

A very interesting structure is the outdoor shelter, or "pavilion," which can be turned so that the sun rays may be enjoyed for as many hours as possible, and rain, snow, or cold wind may be warded off.

Dr. Pellegrin and Architect Petit, of Paris, have indeed designed houses erected on rotating platforms which can be made to face in any direction. The platform is supported by two concentric walls, and the axis of rotation is occupied by a shaft through which pass the water-pipes. A gas-engine moves the platform, which may be harnessed to clock-work. The latter may be so arranged as to enable the house-front to follow the sun during the day.



FIG. 52—Revolving shelter. (Hillier.)

My good friend, Dr. Peters, is a genius who has gone into the practice of medicine. He has discerned the possibilities of "super-annuated trolley-cars for consumptives." Pine Ridge Camp, near Providence, Rhode Island, of which he is the superintendent, was established in 1903. There was, to begin with, an administration building, dining-room and kitchen, several cabins, twenty tents, and trolley-

cars. The cost of the entire plant was two thousand five hundred dollars. Patients paid something—as they could, from one dollar a



FIG. 53—Old street-cars as living quarters for the consumptive. Pine Ridge Camp, Rhode Island. (Courtesy of Dr. W. H. Peters.)

week—for their maintenance. The cost of the institution per capita has been four dollars and fifty cents a week. The deficiency was made up by the contributions of citizens.



FIG. 54—Interior of old lean-to. Sleeping quarters, Loomis Sanatorium Annex.

Trolley-cars that had outlived their usefulness were used as an experiment. The bodies of the cars, which were in excellent condi-

tion, were taken from their trucks and set up on a foundation eighteen inches from the ground, each being furnished with a cot-bed, stove, table, and chairs. The patients are thus made very comfortable. The trolley-car is the consumptive's ideal sleeping pavilion, capable of perfect ventilation, and gleaming all the sunshine that is going. It is claimed to be far ahead of the average cabin or shack, and the cost is much less. These cars are very heavy. They are finished in hard-wood, with windows and door-frames made to stand the severest weather. Double-walled cabins or shacks, accommodating two patients, approximate one hundred and fifty dollars in cost. Dr. Peters found the average cost of discarded cars to be



FIG. 55.—A mountain home. (*Journal of the Outdoor Life*, Trudeau, New York.)

twenty-five dollars, and no doubt many companies would be glad to donate their unused cars to so worthy a charity as a consumptive home. This the Providence Traction Company has done for the Pine Ridge Camp.

The "lean-to" (Fig. 54) is developed from the idea that patients not only do well by being all day out of doors, but that they do even better by being practically out of doors throughout the twenty-four hours. Dr. King, the physician-in-chief at the Loomis Sanatorium, Liberty, New York, "having in mind the old-time Adirondack 'lean-to' camp, built of a frame-work of poles covered with bark, provided the carpenter of the sanatorium with a rough sketch from which, without further instruction, he built a shed with an overhanging roof, open

in front, with the ends so constructed that they can be opened or closed as occasion demands." In Appendix E is described succinctly the manner in which this "lean-to" has been developed out of the original idea, the successive improvements upon it, and the cost of this admirable structure. Dr. King believes that this plan meets the requirements for open-air cure more completely and satisfactorily than most others (including tents).

At Lake Placid, in the Adirondacks, an experimental camp has been planned on three sides of a hollow square fronting a camp-fire, with chimney and fireplace in the covered portion directly opposite the camp-fire (Fig. 55). The main roof is raised two feet above the roofs



FIG. 56—Nathan cottage, Adirondack Cottage Sanatorium.

of the sleeping-rooms, allowing free passage of smoke when the wind blows from the camp-fire. This raised roof covers only the open space in the middle of the building, the roofs of the sleeping-rooms being tight. The structure is, in fact, a house with one side left off. This experimental camp accommodates six persons, each having his own room (twelve could be accommodated in an emergency), to cost one thousand two hundred dollars, with but three hundred and fifty dollars extra for equipment. This would make the cost per head a little over two hundred dollars. The patients are in the open air all the time, but sheltered from storms. Small enclosed brick buildings could be used for those remaining all winter in the woods. It is considered that a State tuberculosis camp for poor patients upon this

plan would be cheaper and better than that of brick or stone sanatoria; the sum required for the latter would provide for five times as many patients during at least six months of the year. The idea is to have open camps, in suitable localities, grouped around central buildings.

The cottage which Mr. Max Nathan has generously had erected is an admirable type of the single permanent building in which a few patients may live. The newest of its sort in the Adirondack Cottage Sanatorium, its cost was in all about five thousand six hundred dollars. Messrs. Scopes and Feustman were the architects.

The handbook of the Charity Organization Society contains an excellent plan for a municipal sanatorium, providing for pavilions, central buildings, and one hundred and twelve tents, which are to be arranged in streets, with wide spaces.

CHAPTER II

DISPENSARIES

To formulate the objects of such a dispensary my own experience and thought would suggest the following :

- (1) As complete an investigation of the patient as possible, including history, physical and bacteriological examination, and, when the diagnosis is doubtful, the tuberculin test and an X-ray examination.
- (2) Investigation of the patient and his surroundings at his home, including the hygienic condition of his domicile.
- (3) Instruction both of the patient and his household in personal and domiciliary hygiene, and the safe disposal of the sputum.
- (4) The free supply to poor patients of pocket- and house-spittoons.
- (5) Securing entrance into sanatoriums for curable cases, and into consumptives' hospitals for incurable ones when they cannot be properly treated at home ; or, when neither is possible, to treat the patient at his home as well as the conditions will permit.
- (6) Aiding poor patients to obtain suitable food and other articles necessary for their proper care.
- (7) Affording opportunity to physicians to send their poor patients for diagnosis when desired, as well as advice and assistance in treatment.
- (8) The examination and oversight of patients who have returned from sanatoria.
- (9) Opportunity for the scientific investigation and study of tuberculosis and various methods of treatment.
- (10) Clinical instruction to students and physicians in the examination of tuberculous patients.—Oris.

In a recent symposium in the Medical Section of the New York Academy of Medicine the work done in the clinics of the New York Health Department and of the New York Nose and Throat Hospital, in the Gouverneur and Vanderbilt dispensaries and at Bellevue, was set forth by Dr. Knopf, Dr. Barton, and others. All these stations were established (none earlier than the fall of 1903) exclusively for the purpose of treating poor consumptives and of preventing the spread of the disease among their intimates.

The treatment in these stations has for its essentials : The instruction of the patient concerning the disposition of the infective agency ; and the assuring of the patient, so far as is possible, the benefits of rest, sunshine, and good food. The work done by the physicians and nurses in the dispensaries is supplemented by visiting nurses, who visit the patients' homes, further acquaint them with the nature of the

disease and its infectious or communicable character, and explain the simple methods by which infection in the home is to be avoided. And elementary rules and advice, printed in various languages, are provided in the dispensaries and distributed by the visiting nurses, for the patients' better understanding of the situation.

In connection with the work of these institutions four propositions are worthy to be reflected upon :

1. Consumption is pre-eminently a disease of humanity's submerged strata. This is a fact, as patent as any in the history of mankind.

2. Consumption is contracted mostly by those suffering from malnutrition and starvation. As details (yet very important ones to an appreciation of the situation) one should note the indigestible quality of the food as commonly prepared and cooked by the wives of poor workingmen, with consequent excessive fermentation and development of toxins. There is here provided ideal pabulum upon which

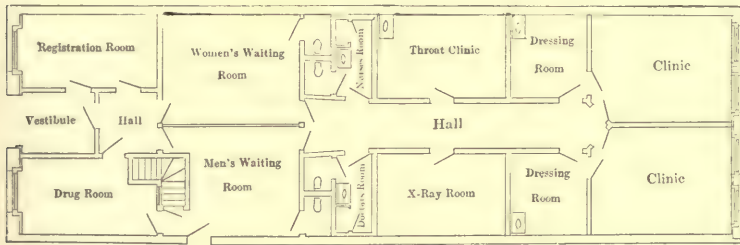


FIG. 57.—The Health Department of New York City. Clinic for treatment of communicable pulmonary diseases. (Courtesy of Dr. Knopf and Messrs. Wm. Wood & Co.)

the bacillus and its allied micro-organisms may nourish themselves and multiply. This bad cooking is, incidentally, as potent a factor as any other in driving men to drink; and if the W. C. T. U. would take it upon themselves, in place of at least one among their already multitudinous activities, to teach their sisters how to cook, there would be less occasion to blame men for becoming drunkards. The chaotic indulgence of the appetites and the exhaustion resulting from excessive sexuality among the wretchedly poor are also factors which must be considered; we must not here forget Malthus.

3. The communicability of tuberculosis depends almost entirely upon the house. And such is certainly the case when the house is dark, dirty and germ-inviting, unventilated, with damp walls, inadequate drainage, and horrible plumbing conditions.

4. In 98 per cent. of all cases of consumption home treatment must be depended upon (Osler). The sanatorium treatment is ideal,

but for obvious reasons it cannot and probably never can be utilized generally in the cure of the consumptive.

In view of such considerations as these, it is likely that the work described in this symposium will be found epoch-making in the fight against the great white plague.

These institutions should be maintained in all large cities. In order to assure their thorough efficiency they should not be parts of general dispensaries, but should be devoted only to this disease.

With a view to presenting aspects as ideal as may be of a tuberculosis dispensary, I review at length Knopf's paper, read at this meeting, upon the "Clinic for Pulmonary Communicable Diseases of the Health Department of the City of New York" (Fig. 57). This is a one-story structure composed of a registration-room, a drug-room, a waiting-room for women, one for men, two dressing-rooms for patients, two examination-rooms, an X-ray-room, a laryngological-room, a dressing-room for nurses and one for doctors, and toilet facilities for patients and employees. Throughout this building, which is situated at Fifty-fifth Street and Sixth Avenue, there are tiled floors, all corners being rounded off, and all the rooms light and well-ventilated. A pneumatic cabinet is in course of construction, and no doubt a hydrotherapeutic installation will be forthcoming. All the furniture—desks, tables, benches, chairs, stools, closets, etc.—is made of white enameled iron, easily cleaned and disinfected. The desks and tables are covered with plate-glass.

The objects of this clinic are: Early recognition and diagnosis of cases of pulmonary tuberculosis; the care of patients applying for treatment; the attention and observation at their homes of the indigent needy and ambulatory cases, including those under the care of charitable organizations and all those discharged from the public institutions of the city; the removal to a sanatorium or a hospital of cases requiring such care; the provision of a "clearing-house" to which all cases of tuberculosis may be referred; and the extension and strengthening of the sanitary control of tuberculosis among the poor by the Department of Health.

In order to furnish the patient with information concerning his mode of life, his duty towards himself, to his immediate environment, to the physician, and to the public in general, Dr. Knopf prepared for the Clinic's patients a table of instructions, among which are the following: "Be hopeful and cheerful, for your disease can be cured, although it may take some time. You may improve steadily for months and lose it all by carelessness. Report to the Clinic when directed. Report immediately if you have fever, intestinal trouble,

diarrhoea, constipation, pain, increased cough, or reddish expectoration. If you are too ill to come to the Clinic, send word. If you are in doubt about any matter concerning your method or mode of living, ask your doctor. Your cure depends upon obeying all instructions faithfully." These instructions are translated into German, Italian, Hebrew, and later will be translated into Bohemian, Russian, and probably into Chinese.¹

This Clinic was formally opened March 1, 1904, since which time, up to May 15, 1905, seven hundred and ninety-four patients, of whom five hundred and sixty-five were males, have applied for diagnosis and treatment. The total number of visits by ambulatory patients average thirty-three a day. Of the seven hundred and ninety-four patients the first sputum examination revealed the presence of the bacilli in one hundred and fifty-five cases; in three hundred and thirty-one the first examination of the sputum was negative, but the symptoms and physical signs were evident enough to make the diagnosis positive; seventy-two patients were referred to sanatoria or special tuberculosis hospitals; one hundred and sixty-four were referred back to their private physicians or to general dispensaries as non-tuberculous.

We observe from these figures that it is not safe to rely upon bacteriological examination alone, or to wait for the inauguration of treatment until the bacilli are found. Again, a social factor is revealed in the statement that sixty-eight patients gave wrong addresses, of whom fifty-five were positively diagnosed as suffering from pulmonary tuberculosis. Among the reasons which may have prompted these applicants, no doubt the most frequent was that they did not wish their neighbors, friends, or boarding-house keepers to know that they were suffering from consumption.

Among the other papers read in this symposium was that of Dr. J. A. Miller, who described the dispensary treatment at Bellevue Hospital. The patients were carefully examined,—the temperature, pulse, respiration, chest measurements, and weight having been taken. If they were found consumptive the name and address were taken and given the nurse for visitation; and the sputum was sent to the Health Board for inspection. Printed circulars and other information and instruction were given them, and the diet dwelt upon. Milk and eggs were provided if applicants were too poor to buy them. Pocket sputum boxes were given the patients, who were to return once a week for treatment. A thorough investigation of home conditions was made and

¹ Appendix G.

reported by a special nurse, who tried to arrange the whole domestic economy of the patient and to demonstrate practical disinfection. Proper education of the patient and of his family with regard to hygiene and the prevention of the spread of the infection was attempted, and circulars of information were given. A study of the social and economic conditions as obtained in each case was made, and upon this was based the management of each case. Milk and eggs were provided from the hospital store. Tents and cottages were placed upon the hospital grounds, and the institution kept in close touch with sanatoria and charitable organizations, such as the Charity Organization Society. During seven months there were one hundred and sixty-six cases. The nurses made four hundred and eleven visits to their homes.

Dr. J. L. Barton, of the Throat, Nose, and Lung Hospital, considered that patients in the incipient stage, and those whose vitality was not utterly exhausted, not only improved, but got well; that organized clinics with trained district nurses will do more to eradicate the disease than can be done in any other way; that hospitals should be provided for those having no means; that advanced cases are likely to be centres of infection; that the greatest cause of the spread of tuberculosis was malnutrition.

Dr. John Huddleston considered that since the inception of the dispensary treatment in New York City more than five thousand consumptives were believed to be under control, and these people, properly treated and instructed, were being made centres of instruction rather than of infection.

Though a part of the general dispensary of the Presbyterian Hospital in New York City, the tuberculosis work instituted by Dr. Shively in its heart and lung clinic is perhaps the first in that city upon modern lines.

The dispensary of the Post-Graduate Hospital in New York City has some unique features. It is in charge of Dr. Russell, who accepts for treatment adults in any stage, provided the disease is uncomplicated and that the patients are able to report twice a day and secure at the dispensary suitable food, clothing, and shelter. An emulsified mixed fat is dispensed. The hours are arranged in the evening for the convenience of working men and women. Irregularity of attendance or failure to obey directions is followed by dismissal. There is a session on Sunday mornings at nine.

The first dispensary for the exclusive treatment of consumption was inaugurated, it seems, by Dr. Calmette,—the Emile Roux Dispensary, in Lille, France. "The Germans," states Knopf, "came next with

their Polyklinik für Lungenkranke." In Edinburgh there is a flourishing institution, established through the efforts of Dr. R. W. Phillips. Throughout Europe, and in some South American republics, there are dispensaries for the treatment of tuberculosis. In Havana there is an excellent dispensary, established by the medical department of the United States Army for the treatment exclusively of tuberculosis. In many American cities—Boston, Baltimore, Philadelphia, New Haven, Scranton, Minneapolis, Chicago, Worcester, Providence, and in Canada—admirable work of this sort is being done in behalf of poor consumptives. The trustees of the Western Reserve University, in Cleveland, Ohio, claim the honor of having established the second antitubercular dispensary in the United States. Co-operating with the medical faculty in this work are the Association of Nurses and the Associated Charities of Cleveland. The question of a dispensary in connection with the work of the Canadian League for the Prevention of Tuberculosis is being agitated in Montreal.

The Henry Phipps benefaction has its dispensary in the heart of Philadelphia. It was established despite great opposition, the fear being that the inhabitants of the city might become infected by reason of its proximity. In 1899 a law was passed forbidding the erection of hospitals or homes for patients with contagious diseases in the built-up portions of cities. But Dr. Flick succeeded in having it amended to admit of the construction of the institution which Mr. Phipps's gift made possible. Flick well said: "The prejudice against having a hospital in the midst of a city is foolish. Such an institution is a safeguard to a community, not a menace." I for my part think such a prejudice is much worse than foolish among a people who are alleged to live in conformity with Christian principles.¹

¹For the invaluable rules for the patients of this dispensary, see Appendix G.

CHAPTER III

THE VISITING NURSE

If, then, those who are engaged in this most gracious ministry—the care of the sick—add to their healing art some knowledge and some enthusiasm for the science of philanthropy, which, after all, no less than the science of medicine, underlies their art, they will surely exert what will be very nearly a preponderating influence in the relief of distress, and in that larger, more attractive undertaking, of which we are becoming dimly conscious,—the working out of a better social order, in which there shall be less of sickness ; less of suffering ; less of premature decay and death.—more of healthy living ; of wholesome, rational enjoyment of life.—
DEVINE.

It is to Miss Lillian Wald that New York City is indebted for the inception of its plan of district nursing which now obtains.

Soon after this lady's self-appointed work as a nurse began she came into contact with some of the dreary hardships of East Side life. She studied certain seemingly irremediable ills, until she was fully convinced that many of them could be prevented by some practicable method of bettering general conditions. Realizing that a thorough knowledge of existing conditions was the first step to this result, she determined to live among the people whose needs were so great and so little recognized.¹ Being joined by Miss Brewster, they spent together two months at the college settlement in Rivington Street. Here they worked and planned with an energy so tireless and an enthusiasm so vital that other earnest women began to gather around them. At first these two were able to cover nearly the whole area on the East Side, now divided into many districts. By degrees the great efficiency and the spirit of neighborliness which they displayed began to be realized and appreciated, and from branch to branch of a family, from friend to friend, from house to house, from street to street, the knowledge and confidence spread ; and the calls for them increased until they had to invoke the services of coworkers. So that to-day the field of their activity covers nearly the whole Island.

Miss Wald is now head-worker of the nurses' settlement, which has its headquarters on Henry Street. The varied and tremendously out-reaching phases that have sprung up in response to needs of all kinds cannot be here described. The department of district nursing, which is under the charge of Miss Hitchcock, alone would require a

¹ Boutelle.

long article for its description. A district nurse must undergo a probation, during which, besides technical skill acquired at the hospital, her qualifications essential to this special work are gauged. She must be heartily in earnest; free from hysterical enthusiasm, such as is apt to be short-lived; tactful, firm, patient and courage-compelling. If she be qualified she may enter upon her duties as soon as there is a vacant place for her to fill. The reason that she is not at once employed is that new districts cannot be added until the very modest salaries of the nurses assigned to them can be paid. There is no general endowment fund. The compensation is forthcoming through some individual or society sensible of these services to the community.

A catholicity of spirit is strikingly attested in the list of supporters. The Society of Ethical Culture, the United Hebrew Societies, the Presbyterian Church, and many other organizations supply these nurses, and the recognition of this broadness of view is shown in the confidence of all physicians in touch with this work. Miss Wald and her colleagues have the cordial co-operation of the hospitals and of the Health Department. The steadily growing trust and affection of the people themselves may be realized when we read in the report of 1903 that one thousand seven hundred and four patients were treated at their own request or that of their friends; one thousand five hundred and sixty-three more were reported by physicians of the neighborhood; six hundred and twenty-seven by charity agents; and one hundred and twenty-seven by the Health Department. Thirty-one thousand five hundred and sixty-eight visits were made, exclusive of two thousand seven hundred and seventy-six friendly calls upon patients.

In every household the nurse makes her efforts felt in visible manual service, such as dressing wounds, cleansing utensils, and kindly assistance. Whatever she does, she does not only in the way that is most simple and effectual, but she shows how it is done. To slovenly households she proves that cleanliness and order are conducive to cheer as well as health. To homes where extreme poverty has not been able to drive out instinctive neatness she brings methods that save the time and strength of the homemaker, and in many families with a modest competency she brings great relief to worn mothers, who see with almost incredulous gladness that the children they were so loath to trust to any one's care but their own are receiving such relief as they themselves would have proved powerless to give.

Miss Wald evidences the advantages to the sick of the co-operation of the district nurses with various charitable societies: "Relief may come from various sources, and can be secured through the nurse or visitor without unpleasant effect. I have known frequently a sick

person receive milk from the New England Diet Kitchen, ice from a fund, groceries from a society, bedding from the settlement, physician and supplies from the dispensary, cot and delicacies from a neighboring club, and flowers from a guild,—all summoned by the district nurse and not differing, except in degree, from care received by the well-to-do.”

There are now many district and visiting nurses' associations in this country,—in at least fifty-three American cities; this does not include nurses engaged by individuals, or nurses who are on their own account devoting themselves to the visitation of consumptives in their homes. Miss Grace Forman, of the Vanderbilt Clinic, New York City, has done excellent work, as has Miss Jean Hopkins, of the Bellevue Clinic, and Miss Reba Thelin, visiting nurse of the Johns Hopkins Dispensary. A society of professional and charitable men and women is doing noteworthy work in Chicago. In Boston the district nurses co-operate with the Board of Health. A national society or federation of district nurses will no doubt be forthcoming to consolidate and make more efficient this excellent work. London has its training home for district nurses, who do splendid work, and this is so, no doubt, in other European cities.

Miss Nutting, of Johns Hopkins Hospital, has presented a number of valuable data, which she has collected after communicating with some twenty-five societies. The cost of treating tuberculous patients in their homes and in hospitals is compared. It costs not less than one dollar a day to care for one patient in a hospital; generally it is up to two dollars and over. One patient so treated would therefore cost to maintain from four to six hundred dollars. Hospitals reach the consumptive few, nurses the consumptive many, and “if we have any hope of reaching even a moderate proportion of the 98 per cent. of tuberculous patients who, Dr. Osler says, must be treated in their homes, the provision of a sufficient staff of nurses in each city, specially devoted to this particular work, would seem to be a necessary initial step.”

To the homes of consumptive patients milk (the best to be had), from one to two and a half quarts daily, and eggs, from four to eighteen within the twenty-four hours, are sent, according to the patient's condition. To these staples meat, fruit, and other articles are occasionally added. These needs are largely met through diet kitchens, relief societies and benevolent people. It is hoped that students of domestic science will become interested in placing within the homes of the poor simple facilities and easily comprehended instructions how to live and how to prepare plain, healthful, cheap food. An extremely important feature of the visiting nurses' work in Boston is the reporting by the

nurses who visit obstetric patients and report to the district doctor any symptoms suggestive of tuberculosis in an expectant mother. She is examined, and arrangements are, if necessary, made to put the baby at once upon modified milk.

Without variation the news comes from every nurse and every society that "the patients are nearly always in an advanced stage before we are brought to them. Here much relief and comfort can be brought; improvement or cure is rarely to be expected. Much can, however, be done beyond the actual alleviation of the condition, work so dear to the heart of the nurse, the achievement of which has been for so many ages her sole thought." Even though the patient may not be saved, the rest of the family may be safeguarded from further danger of infection. The nurse, above all, is an educator,—a consideration of fundamental value to the community.

Edward T. Devine, Esq., groups visiting nurses into four classes,—the nurse: the instructive nurse; the incidental nurse; the pseudo-nurse.

The nurse takes definite professional responsibility for cases of sickness, just as do private nurses engaged for family work.

The instructive nurse may do any or all of this and necessarily does some of them; but she is primarily nursing the family rather than the patient. It is an essential part of her work, not so much to care directly for the patient, but to show other members of the family, or neighbors, or the patient himself, how to do this. The teaching of sanitation and cleanliness is her strong point.

The incidental nurse is a trained nurse who is, however, engaged in tasks of various kinds, for which the training and experience of a nurse are a valuable preparation. She may be the matron of an institution, or a visitor of a charitable society, or a missionary, or a settlement worker. She makes incidental use of her equipment as a trained nurse. Herein she has great advantage over others who have not had the same or some similar training.

The pseudo-nurse is one who, although appearing in the guise of a nurse, and securing entrance to the home because she is a nurse, nevertheless is, primarily, a missionary bent on conversions to her own particular creed; or a settlement worker out for the purpose of drumming up recruits for a social club or an educational class; or the investigator of a charitable society seeking facts in regard to the alleged distress of the family; or, in short anything else than what she appears to be. "For the instructive nurse, and for the incidental nurse, we may have entire respect and regard, for both make it perfectly evident upon what particular errand they have come. But the pseudo-nurse—who is the

nurse only in order to receive admission ; only in order to gain confidence ; only in order to establish an influence with the family—stands upon a somewhat less reputable footing.” This is unquestionable and very true.

I saw at the Baltimore Exposition a visiting nurse’s kit,—a bag containing scissors, forceps, and artery clamps, bichloride tablets, green soap, nail brush, a hypodermic syringe, a thermometer, safety pins, matches, a sputum cup, paper napkins, a medicine glass, a drinking cup, a chart, and circulars for the instruction of consumptives.

From time to time we hear of nurses—it must be evident from the reading of this section that there are few—who will not take cases of consumption, being fearful of the disease. For those among the laity who are afraid, or selfish, setting a preposterous and inordinate value upon their own existences, we have only sentiments of amusement and scorn. But the nurse is like the soldier. When the latter lacks courage he is fit only for hanging—not deserving even the honor to be shot. The work of the nurse is not a business ; it is a profession, a consecration. However, to the vast army of the unafraid among nurses, it must be evident that the danger from visiting consumptives is not great, and is easily avoidable. It is essential that the nurse preserve her health, her strength, and her powers of resisting infection. She must have pure air, good food, and wholesome exercise. She would do well, if she sweeps and dusts the rooms of consumptives, to use an aspirator (the Fraenkel contrivance, for instance), or several thicknesses of sterilized gauze. To be constantly close to the patient is unwise ; the breath alone is very rarely dangerous ; but the fine droplets of sputum and the coughing may be. If she have a “ cold,” or has had pneumonia, or gripe, or pleurisy, or any enervating disease, she should give up caring for the consumptive, transferring her work to a vigorous professional sister.

While attempting to give the work of the trained nurse its just due, let us not forget the beautifully self-abnegating, if not strictly scientific, work which has been done and is, I hope, still being done by the Salvation Army. The disruption in this organization robbed it, I fear, of much of its beneficent influence ; and if my fear is justified, it is certainly a calamity for civilization. There does not begin to be space enough in this book for a just estimate of this work. I set forth but a detail :

Two Salvation Army “lassies” would hire a dirty two-roomed apartment in the slummiest of tenements. They would at once set to work scrubbing its floors, banishing its cobwebs and its soot, white-washing its walls,—making it a model of decent, homely cleanliness.

Then, at a cost of a few dollars, they would put in a small stove, a clean bed, a rough table, two or three chairs, and a few cheap kitchen and other household utensils. The women of that tenement would visit them after their neighborly fashion. The lassies would then waste no time expounding the genealogy of King David, or turning the thoughts of their visitors to higher, nobler things, but would rather show them practically how much of life's necessities they could buy for a dollar. They would teach them how to cook decently for their husbands. Above all, they would put heart into them. I am fond of imagining the poor Nazarene going unseen with these lassies in their work among these, His own people.

CHAPTER IV

HOSPITALS FOR TUBERCULOUS CHILDREN

In one of the last letters that he ever wrote, suffering and almost dying himself, Robert Louis Stevenson said :

“ I have been getting some of the buffets of late ; but have amply earned them—you need not pity me. Pity sick children.”

THE French Government has demonstrated a very deep and rational understanding of some of its domestic problems. For instance, it has nobly undertaken, on a splendid scale, the care of the tuberculous or scrofulous children of its people, for whom it has established in various parts of France large and excellently equipped hospitals. Several of these institutions are on the sea-coast ; and there these puny sufferers are assured the benefit of the sea-air and of ozone ; lots of sunshine, plenty of pure food-stuffs,—bread, meat, milk, and eggs ; careful nursing ; and altogether adequate medical care of their “ white-swellings” of the joints, tuberculous affections of bones, and of the many other conditions requiring the physician’s attention. Thus, instead of early deaths, or, what is worse, of the prospect of growing up weaklings, most of these children are vouchsafed happy futures and strong constitutions thereafter resistant to infection. And hygienic habits are inculcated in them which they are sure to disseminate after their graduation. In this manner are secured to the State many worthy and virile citizens, who would otherwise be lost to it ; and there are surely none who serve it more faithfully or more gratefully. Here is certainly a movement worthy the consideration of the statesman and the political economist.

John S. Ward, Jr., Esq., a member of the board of managers of the New York Association for Improving the Condition of the Poor, was in France in the summer of 1903, where he visited many of these institutions. His observations were all the more interesting from the fact that there was at that time no hospital in the United States which was exclusively set apart for children suffering from tuberculosis.

At Berck-sur-Mer, near Calais, the City of Paris maintains the Hospital Maritime, which institution was founded in 1861, has grown up to cover a large amount of land, and contains seven hundred and fifty beds, all of which are occupied. A nominal charge is made ; and it costs per day for each patient a sum equal to forty-five cents, which includes light, heat, medicines, food, wages, incidentals, and the cost

of transporting the children to and from Paris. Every tuberculous manifestation is treated here; but this hospital is primarily for the treatment of other than lung tuberculosis, the sea air being not generally beneficial to those suffering from pulmonary diseases. However, as we have noted, the lungs are generally not the primary seat of the disease in children. The patients vary in age from three to fifteen years, and the average period of their stay is one year, although some are there for only three months and others as long as three years. An average of about twenty-nine per cent. are discharged as cured.

A unique feature of the hospital is the large double-deck railway trucks which are used to carry the children, if necessary, from the institution to the very water's edge. Here such children as are helplessly bedridden have their beds gently transferred to the truck, whence they are taken to the beach, where they may during many hours enjoy the beneficent sea-air. At Berck are also the hospitals Rothschild, Bouvril, the Parmentier Cornu, and the Cazin Perrechaud, in which the cost of maintenance is considerably less, for the reason that the thirty nuns who nurse the two hundred children serve without price.

The sanatorium at Pol-sur-Mer is situated three miles from Dunkirk. It receives two classes of children,—those sent from the hospitals of Lille or other manufacturing towns in the north, suffering from surgical tuberculosis, rickets, or other definite diseases, and convalescent or debilitated children who are admitted during the summer months, either to complete their recovery or as a prophylactic measure.

Another sanatorium is in course of erection at Zuydecoote near by, and it is proposed that here the elder convalescent children shall be trained and encouraged to become farm-hands and agricultural laborers in order to keep them away from their unhealthy surroundings at home, chiefly in mining or industrial districts.

At Hendaye, on the Bay of Biscay, near the Spanish border, the City of Paris maintains the second of its institutions. On account of its benignant and warm climate a few pulmonary cases are here received.

At Ormesson, Villiers, and Noisy, in the vicinity of Paris, and within a short distance of one another, are free hospitals for children having pulmonary consumption, maintained by a charitable organization—L'Œuvre des Enfants Tuberculeux. The building at Ormesson is splendidly equipped. It receives boys from three to ten years of age in the incipiency of the disease, and has accommodations for one hundred and twenty-eight.

At Villiers-sur-Marne there were in 1902 consumptive boys ranging in age from ten to seventeen, to the number of two hundred and ten. The society which maintains this establishment recognizes the possibility that patients who return to unfavorable surroundings will develop again the symptoms they had lost. A *colonie sanitaire* has therefore been established as at Zuydcoote, where convalescents are taught gardening and farming. Great hopes have been entertained that this would be a means of attracting young lads to a country life and of getting them away from hurtful town surroundings. Unfortunately it is found almost impossible to retain them; the town influence is too strong in them, and they never settle down happily to country life.

The hospital at Noisy is for girls only; here, as at Villiers, an endeavor has been made to interest the older children in outdoor occupations, but again with small success. Town instincts are as firmly rooted as in the boys.

At Villepinte, near Paris, there is another hospital which receives consumptives from three to thirty years of age. This institution is a godsend to the incurable—those who are doomed to die—for such patients are not received in hospitals generally, there being no room for them. There the last days of the afflicted are made as comfortable as may be. Other hospitals near Paris are those at Forges-les-Bains (for convalescent children), and at Bois-Colombes.

Mr. Ward on his return put his association in possession of much information upon which it might, if it seemed meet, proceed to erect a sanatorium for New York City children suffering from non-pulmonary forms of tuberculosis. To such work as this the association would be no stranger; for it has already had for many years a fresh-air home for poor women and children on Coney Island, called Sea Breeze. Of such children there are probably four thousand, three-fourths of whom live in tenements. Among these there were one thousand one hundred and eighty-four deaths in 1902.

In February of 1904, then, a large sum was appropriated for the maintenance by this association of the first American experiment in providing treatment at the seashore for children suffering from non-pulmonary forms of tuberculosis, and a series of tents were put up at Sea Breeze by way of experiment.

And when the winter of 1904-05 came on, rather than return these children to overcrowded tenements, where their tuberculosis must very likely have recurred, they were transferred to a portion of the permanent structure at Sea Breeze. Here, one very cold day, Dr. J. W. Brannan, of New York, visited them. He came upon a number playing in the snow. Mitts were dangling by strings about their necks;

but they were not in use. While chatting with them, they told him they had to go into the building to get their temperatures taken. He went in with them. The windows were wide open. He wanted to keep on his hat; but as no one else was covered, he removed it. His hands were gloved. He took off his gloves. The children affectionately took his hands, one on each side. They said his hands were cold; he found theirs to be warm. Then he felt the hands of others, and made the same observation. The windows were open wide *throughout the twenty-four hours*, except for half an hour mornings and evenings, when the children dressed and undressed. These children were tuberculous; but, except for the surgical manifestations, one would never have imagined it. Dr. Brannan (he spoke in discussion of a very interesting paper by Dr. L. R. Williams, before the New York Academy of Medicine) had not in his professional life seen curative results comparable to these. They were rosy-cheeked children with one exception,—a white-faced child. "She came yesterday," was the explanation made by one of her companions. And in general terms the surgical lesions progressed wonderfully toward *complete* recovery. Statements were made by Dr. Homer Gibney and others to the same effect.¹

Unquestionably there is need for not one but many such hospitals for tuberculous children. And of several that are now building we have space to mention but one or two. These institutions, among other blessings, provide that children upon whom it is expected to operate in city hospitals will receive such nourishment and other means of invigoration that they may be rendered fit for the ordeal; and children, who have been operated upon in the city hospitals, are taken care of during their convalescence.

The work done in New York City by St. John's Guild, while not directly concerned with tuberculosis, nevertheless has to do with so large proportions of such cases that it has an interest for us here. This charity maintains two "floating hospitals" and a seaside hospital for sick children. The former are fitted with accommodations to take both sick children and their mothers and the well children, who must go alone, on fresh-air trips down New York Bay and back. Their purpose is to combine with the needed fresh air and salt-water bathing such medical aid as will in very many cases protect them from diseases incidental to childhood. In addition, these hospitals are of great use as floating ambulances to bring to the seaside hospital children

¹ Results here are probably better than in French institutions, for the reason that in the latter the windows are nearly or wholly closed in cold weather.

who need treatment, prolonged sometimes for weeks. The child is taken in hand by the physician as soon as it comes upon the floating hospital, and when it reaches the seaside structure, which is to be its temporary home, treatment is instituted which generally results in its restoration to health and strength. Many such infants are scrofulous, or have tuberculous infections of bones and joints, such as we are here concerned with. The surgical observation is pertinent, that operation in such cases is never radical. A single operation does not cure the child of its disease, as we may infer from a consideration of its nature. After operation the most wholesome conditions possible are essential to complete recovery.

A detail of the floating-hospital work is the modified-milk department, which provides daily from thirty to one hundred and seventy bottle-fed infants with milk, prepared according to the formulæ ordered



FIG. 58—At the country sanatorium of the Montefiore Home. (Courtesy of Dr. Alfred Meyer.)

by the hospital physician. This involves the preparation every day of from five to thirty gallons. The permanent hospital of the Guild is situated upon an excellent beach at New Dorp, Staten Island.

One afternoon I was a delighted guest of Dr. Alfred Mayer and of Dr. and Mrs. Rosenberg in the "country sanatorium" of the Montefiore Home, which institution provides for tuberculous children as well as adults. I certainly can give no better impression of sanatorium life among children than to set forth excerpts from *The Review*, published by them, under the guidance and with the advice of Mrs. Rosenberg.¹

At the sanatorium at Stony Wold in the Adirondacks women and

¹ Appendix D.

boys (none over twelve) and girls from eight to eleven, suffering from tuberculosis, are taken care of. Children "are much more benefited by the open-air treatment, which they insist upon taking in a more energetic manner than the older patients,—sliding down hill, riding on the logs with lumbermen, building snow houses, and enjoying themselves in ways familiar to children. A competent teacher gives them daily instructions, classes being held each morning in the library."

In Boston, a shack twenty by forty feet, lighted by ten windows, which are open day and night, has been built at Wellesley Hills. The children sleep between blankets in flannel caps and night-gowns, and wear woollen bed-socks. In the daytime they wear flannel under-



FIG. 59—The country sanatorium of the Montefiore Home.

clothes, dresses, sweaters, and woollen hoods. There has not been a case of sore throat or cold in the head, and appetites have improved. The children are those treated in the hospital for tubercular disease of the joints and bones, and tubercular pleurisy and peritonitis.

In an interesting report of the New York State Hospital for the care of Crippled and Deformed Children, it is noted that its present small building at Tarrytown can accommodate only twenty-five patients, and that the need of a much larger hospital is evident. "The State has already anticipated this demand by appropriating \$5000 to buy a suitable site, and no doubt before long further appropriations will be made to build and equip a hospital in which five hundred patients may be accommodated."¹ The residence of many

¹New York Medical Journal.

who have tuberculous hip joint and spinal disease is likely to be several years. Though benefited by treatment for a few months, they would speedily relapse after a return to the tenement-house life or to their isolated homes in the country. It is the intention of the managers in this hospital to keep their patients under treatment long enough to effect a permanent cure in all cases where the environment is unsatisfactory at home; and this means years for many of them. It is certainly unwise economy on the part of the State to treat a child with tuberculous joint, for example, for a few months, and then to discharge it prematurely, with the certainty that the disease would relapse with an accompanying increase in the deformity. The various excellent day schools, which have been established in New York for the education of the crippled and deformed children, who are not received in public schools, present distressing evidences of prematurely discharged hospital patients. The ideal hospital for the treatment of such cases among the children of the poor should aim at both care and treatment until a cure is effected. This means education as well as surgical and medical care.

The example set by this State hospital has moved the Governor of Ohio to appoint a commission of prominent citizens "to report upon the feasibility and desirability of caring for, treating, and educating crippled and deformed children." This commission has recommended the expenditure of \$200,000 for the establishment of a hospital to be erected on a fifty-acre plot of ground. From other States come inquiries and requests for information and advice, and in Minnesota the work has progressed most favorably.

Mr. Tubby, an English orthopædic surgeon, has suggested that there should be a system of country hospitals for the care of surgical tuberculosis in children. There are plenty of hospitals in cities where children can receive proper treatment, but provision for the further care of these little patients has been lacking. Mr. Tubby's plan is that each urban hospital should be merely the central receiving station, where the diagnosis should be made, and the active treatment applied. The patients should thereupon be sent to the nearest branch hospitals for convalescence. Each rural hospital should have its local medical staff, the entire system being supervised by the chief surgeons of the urban hospital, of which the rural institution should be a branch. In these latter, which need not be equipped with elaborate paraphernalia, the children could convalesce under beneficent and cheerful surroundings far better than if they were sent back to their tenements from the over-filled city hospitals.

Part IX

AMERICAN SANATORIA

Over the doors of the wards and hospitals for consumptives, twenty-five years ago, might well have been written these words: "All hope abandon ye that enter here," while to-day, in the light of the new knowledge, we may justly place at the entrance of the modern sanatorium the more hopeful inscription, "Cure sometimes, relief often, comfort always."

TRUDEAU

CHAPTER I

PRELIMINARY

The purpose of these public institutions is both therapeutic and educational. In a large per cent. of the cases brought under treatment reasonably early the disease may be arrested and the patient again put upon his feet. But more than this, he is sent out an enthusiastic and trained missionary of the fresh-air doctrines and of the necessity and methods of preventing the spread of infection. They serve another purpose in that, by removing from the homes, especially of the poor, the source of infection, and that during the period of danger, they lessen the spread of disease. Thus they serve the triple purpose of prophylaxis, education, and efficient treatment.—*Report Indiana State Medical Association.*

I HAPPEN to be writing this in the Christmas season, and so am moved to consider the sanatorium to be what in essence it really is,—something of an expression of that merciful Spirit which, twenty cen-

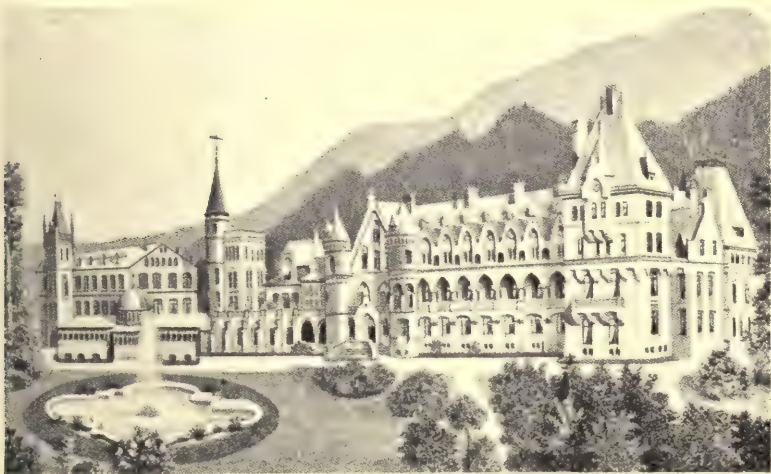


FIG. 60.—Sanatorium at Goerbersdorf.

turies ago, amid brutal and decadent surroundings, manifested a benignant altruism and a humane consideration for the suffering and the afflicted. The sanatorium is in effect a place where those who are consumptive may find rest, may live amid fresh air and in the sunshine, and may have wholesome food in abundance. Here the recovery of most of the sufferers from this disease is confidently expected, at least in the incipient stage; after which they return to their families to take

up again, with restored health and strength, their life work. Those who do not get well are vouchsafed peace and comparative comfort for the rest of their days. And this latter is, I think, a very great thing. It is dreadful to die untimely; but that is not so dreadful, to my thought, as to be suffering constantly while one has breath in his body, to be dragging out one's life in anguish of mind, starving, amid wretched surroundings, and where the God-bestowed sunshine cannot enter.

There is, in one of these sanatoria, a place set apart called "Hearts-ease." It is for those who are not expected to recover. There such sufferers, so long as they can see, may contemplate nature, God's beautiful garment; so long as their faculties remain with them, they may appreciate His beautiful flowers; may hear the music of His birds; may have the nourishment He has provided. Life is so unspeakably precious a thing, I think, that those who must perforce give it up prematurely, ought to be vouchsafed all the happiness possible for them, so long as they have consciousness to enjoy it.

Finally, such institutions safeguard to a very great degree the health of the remainder of the community, so far as this communicable disease is concerned. We shall see, moreover, that wherever they are situated the general health of the surrounding community is better than is ordinarily the case; and that such communities are thereby greatly advantaged in material prosperity.

There are now very many sanatoria in all quarters of the world,—in both North and South America, in every European country, in the Orient, and in Africa. I cannot begin to describe even a few among them. In the following pages I essay but to present the salient points of some of those which are typical, and shall begin with the work at Saranac Lake—the first of its sort in this country—a tale as fascinating and as full of the milk of human kindness as the best Christmas story that was ever written.¹

¹ Concerning American institutions, see Appendix I, and the Directory of the C. O. S., and the N. A. S. P. T.

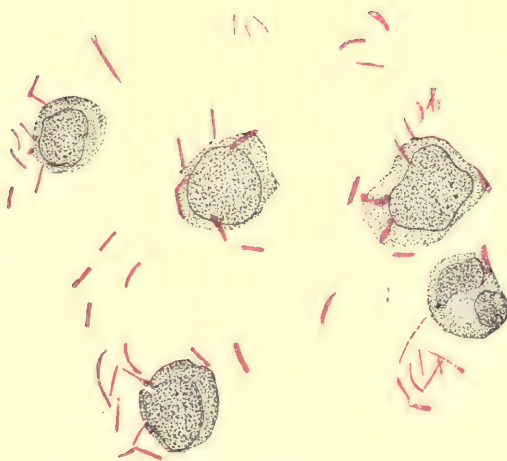


FIG. 61.—Tubercle bacilli, with pus-cells, in sputum. From a case of tubercular inflammation of the lungs. The bacilli stained with fuchsin. (Delafield and Prudden.)

CHAPTER II

SARANAC LAKE

History is philosophy teaching by example.—BOLINGBROKE.

IF in this sentiment we interpret philosophy as the love of learning which has for its objective human betterment, then no history of the American people—no history of humankind, indeed—can be complete which does not make some statement of the inception and progress of the work of Dr. Edward L. Trudeau.

Thirty years ago, having been found to be consumptive, this physician went into the Adirondack wilderness to try to prolong his life. In those days almost nobody ever expected to recover from this disease. "Nothing, indeed, would then have seemed more improbable than that I should have lived to avail myself of the great honor of ad-



FIG. 62—The Sanatorium at Saranac Lake.

dressing you on such an occasion as this, or that anything which could occur in a life spent in those remote and primitive surroundings might be considered by the management of the Phipps Institute at all worthy of your attention to-night.”¹

In 1873 there was little medical interest in tuberculosis, nor did the laity know much about it, except that it was thought to be always inherited and almost invariably fatal. There was then little special hospital accommodation for the consumptive. Most hospitals admitted a few cases to their general wards when they had empty beds. There were a few homes for consumptives in existence, but no institution was presumptuous enough to announce that its object in taking these

¹ Dr. Trudeau's address.

patients was anything beyond affording them a place where they might die. The giving of cod-liver oil, creosote, and anodyne cough mixtures, and the keeping of the wards at a given temperature (the windows being generally kept tightly closed to prevent the patients taking cold), were practically the only attempts at treatment. The

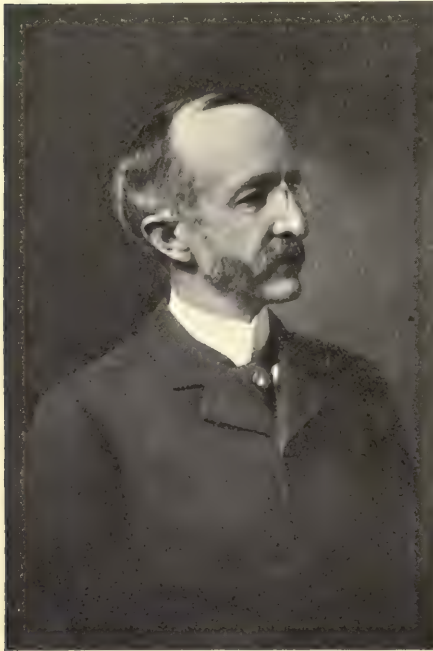


FIG. 63.—Dr. Edward L. Trudeau.

climatic treatment was within the reach of only the well-to-do, and they were not generally sent away until their physicians and they themselves became alarmed at the activity of their symptoms. The poor and those who depended upon their daily work for their support were left to their fate. The Adirondack region was in 1873 a real wilderness visited during the summer months by a few sportsmen. Here Dr. Trudeau met Dr. Alfred Loomis, who, despite his critical condition, encouraged him in his determination to remain at Paul Smith's during the winter. "My good wife cheerfully acquiesced in the plan, in spite of the gloomy prognostications of many medical friends who

tried to dissuade me from so rash a step, and it was entirely due to her courage and determination that we settled down, in 1874, to face the severity of an Adirondack winter, forty-two miles from a railroad or a physician, and completely cut off for weeks at a time by the deep snows from any communication with the outer world." The spring found Dr. Trudeau much improved, to his no small wonder.

The village of Saranac Lake consisted at that time of a saw-mill and half a dozen guides' houses. For fully thirty winters Dr. Trudeau has lived in this region. Long before this time Dr. Brehmer had begun to work out the principles on which the sanatorium treatment of tuberculosis is based, and Dr. Trudeau was anxious to test his methods, the more so as the urgent need became apparent of supplying at Saranac Lake a place where persons of moderate means could be properly cared for.

Thus, gradually, the idea of starting a sanatorium for working men and women, at a cost to them less than the expense of operating it, began to crystallize in his mind. And here we may note in passing, concerning this beneficent institution, that one essential requirement in the candidate for admission is that he shall *not* have sufficient means for his maintenance there.

Dr. Loomis promised the support of his great name and examined applicants in New York free of charge up to the time of his death. The first subscriptions were given by Mr. and Mrs. Anson Phelps Stokes, "whose ever-helpful interest, as well as that of many of my personal friends, has never failed me through these years." Soon \$5000 were collected, and having bought a few acres on a sheltered hillside, with money donated by guides and residents of the village the erection of two small buildings was begun in 1884. Since segregation of patients was the aim in view, the cottage plan was adopted. The first cost \$350, and consisted of one room, heated by a wood stove and lighted by a kerosene lamp. It had a small covered piazza, where, "after much persistence and eloquence," he persuaded his first two patients to sit most of the day at rest. From this beginning the institution has gradually and steadily developed.¹ And the principles of treatment upon which it was founded have become generally accepted over our entire country. The latest cottages are substantial yellow brick and stone structures, eminently adapted for the open-air treatment. Lighted by electricity, heated by hot water and having fireplaces, supplied with baths and running water, each room opens directly on a covered veranda, upon which the patients' beds are easily pushed when ordered temporarily to remain in bed, as well as to sleep out at night upon occasion.

Year by year obstacles were overcome and needs were supplied as they developed,—more land, an abundant water supply, good drainage, electric lighting, a crematory for the disposal of infectious material, an open-air recreation pavilion, many more cottages, a library, a chapel for religious services, an infirmary for the proper nursing of the very sick, and an administration building suited to the enlarged needs of the growing community. All these came into being until a small village of twenty-two buildings, entirely free from any encumbrance, has grown up about the little one-room cottage which still stands as a reminder of the institution's humble beginning. New problems had constantly to be solved. Sooner or later after admission patients would exhibit

¹ The village of Saranac Lake itself has grown to be a town of four thousand inhabitants.

complications of the disease—hemorrhage, pleurisy, tubercular pneumonias, acute exacerbations—so that oftentimes a promising patient would be transformed into a bedridden invalid, who needed for weeks or months constant day and night nursing and attention. In the beginning there were no nurses available, nor money to procure them. There was no resident physician, nor was there a salary to offer him; “so that during the summer I had to do the medical work of the institution as best I could,” to this end driving from Paul Smith’s, fourteen miles each way. But the problems were finally solved. A consumptive physician came to the sanatorium to live, and gave his services in return for board and lodging; and the gift of the Hall and the Childs Memorials provided buildings to which the very sick could be transferred at once from their cottages when acutely ill.

The requisites for admission have been that the applicant should be in the earlier stages of the disease, with a fair chance of restoration to



FIG. 64.—Porch at Saranac Lake.

health, and that his pecuniary circumstances should be such as to preclude the possibility of his paying the prices asked at the hotels and boarding-houses in that region. Five dollars a week has been for twenty years past the charge, despite the greatly increased cost of operating the institution. There is now a deficiency of about four dollars a week on each patient. Every one is on the same basis, there being no private patients and no graded rates. There are no extra charges except when the patients are so ill as to be confined to bed and taken to the infirmary, thus requiring constantly the services of a nurse, special diet, etc., when the additional regular infirmary charge of five dollars a week is made. There is a small free-bed fund, the income of which is applied to defray the expenses of patients whose resources have entirely given out.

During the first years of Dr. Trudeau's work he had much difficulty in filling the few beds in the institution, and on many occasions it took all his eloquence and persuasive powers to prevent the desertion of his patients. Since then the education of the public as to the value of sanatorium treatment has little by little become apparent, so that of late years there has always been a long waiting-list. Not one in twenty applicants can be taken, and many like institutions would be required to accommodate all who seek admission.

The saving and prolonging of lives at the sanatorium has been by no means all that has been accomplished. The hundreds of patients discharged during the past twenty years have been so many missionaries who have scattered over the land, imparting to others the simple but all-important knowledge as to protective measures and hygienic mode of life which they have been so practically taught in the institution. And, besides all this, "by affording a scientific demonstration that a fair proportion of tuberculous patients can be cured and restored to lives of usefulness, the sanatorium has had an influence in bringing about a new attitude of hopefulness towards the disease which has inspired the building of similar institutions."

The sanatorium has been throughout essentially an Adirondack charity, having owed its support almost entirely to visitors who come to the St. Regis and Saranac Lake region in search of pleasure, recreation, or health. Two fairs held each year—at Paul Smith's and the Saranac Inn—have supplied a goodly share of the funds necessary to meet the yearly deficit in running expenses.

It is wholesome, indeed, to read how the financial difficulties attending the progress of this institution were overcome,—how physicians, nurses, and laymen gave of their strength and their skill and their fortunes to this end. "Though the sanatorium has never had money enough to pay for the services required to do its work, this institution has received throughout all these years the kind of devoted service which no money can command, and which has made its work a benediction to those it has sought to relieve."

The narrative of the scientific work done at Saranac Lake by Dr. Trudeau and his assistants, the difficulties they had to contend with, reads like a chapter in a romance. There is now firmly established a laboratory, whose opportunities for original investigation have always been freely placed at the disposal of any medical man desiring to do scientific work in the investigation of tuberculosis. In another section we have dwelt upon Dr. Trudeau's researches with regard to the production of artificial immunity. During the past twelve or fifteen years he has published twenty-one papers and his colleagues sixteen, setting

forth the work accomplished in his laboratory, which is the first in this country devoted exclusively to this purpose.

Not only in the sanatorium and the laboratory has the tuberculosis situation been coped with. The village of Saranac Lake has been constantly called upon to adapt itself to new conditions. An ever-increasing number of invalids, from the well-to-do to the penniless, have made the town practically a cottage sanatorium on a large scale. For the rich there are now beautiful and even luxurious homes, designed and built with a special view to the requirements of the invalids, and for carrying out the open-air treatment in the vigorous climate of the Adirondacks. And these features are also more or less developed even in the humble boarding-houses which abound. An efficient health board has instituted modern methods of guarding against infection. Sanitary rules and regulations are exposed in public places, and enforced as far as practicable in the town, and disinfection and fumigation of rooms recently occupied by the sick is made compulsory.

The residents of Saranac Lake have not been unmindful of the poor consumptive. The district nurse, whose expenses are defrayed by the benevolent, is constantly occupied in instructing and nursing those who are too sick to care properly for themselves; "and when death comes, as it often does to the lonely consumptive far away from home and without friends, the same charitable spirit which has tried to relieve his lot provides him with a decent burial. How little those who so often speak disparagingly of Saranac Lake, because it harbors so many invalids, know of the burden of human misery, not its own, which this small and remote town has ministered to as best it could for so many years."

A bureau of information is supported by the institutions in the town, and assists rejected candidates to find cheap boarding-places, and a free dispensary is maintained at the town office of the sanatorium where medical advice is freely given by Dr. Trudeau's associates.

Among the many merciful works which have been done at Saranac Lake is the Reception Cottage, which has been established and is maintained by Miss Mary R. Prescott.¹ Here a few acutely ill or advanced cases, who cannot be taken at the sanatorium, are often refused at the boarding-houses, and who are in need of constant nursing which they cannot afford to procure, are taken and cared for at a very moderate cost.

Among Saranac Lake's illustrious visitors was Robert Louis Stevenson, who spent the fall and winter of 1889 in Mr. Baker's cot-

¹Appendix F.

tage, which has since become an object of historic interest. "In its little sitting-room Stevenson received the visits of many prominent men, who journeyed to Saranac Lake to see him, and it was in this room, on a cold winter night, by the light of the wood fire in the big fireplace, while Stevenson sat on a chair placed on top of the table, which had been moved into a corner, that Richard Mansfield delighted the great author with his weird and grewsome impersonation of *Dr. Jekyll and Mr. Hyde*

"To a temperament like Stevenson's, which shrank from the grim, inexorable facts of life, and lived in an ideal world, painted and peopled by his own vivid imagination, who craved sunshine, blue skies, and tropical seas and verdure, Saranac Lake in winter, with its ice and snow, its gray skies, and its ever-present and ubiquitous problem of



FIG. 65.—The Prescott Reception Cottage.

human suffering and sorrow, did not especially appeal, but he acknowledged to me, and in his writings also, that his health was much benefited by his stay there.

"He naturally looked with repugnance on the exact and uncompromising methods of scientific research and animal experimentation, and we had many heated arguments on this subject. I finally persuaded him one day to visit the little room in my cottage which was then my only laboratory. He had just written for *Scribner's* a short essay entitled, 'The Lantern Bearers,' in which some of his beautiful thoughts had as a text a game he and the other boys played, and which consisted simply of walking along the beach on a dark night, hiding under their coats a lantern, which was only flashed at each other as they passed as a signal. I was intent on showing him my

animals and culture tubes, and the ravages which are caused by the tubercle bacillus in the organs of animals, and was trying to impress upon him the possibilities which lay in these experiments in advancing our knowledge of a germ which kills one in seven of the human race, when suddenly I noticed that he looked pale, was not listening, and was edging towards the door as fast as possible. As soon as he got outside he turned to me and said, 'Trudeau, your lantern may be very bright to you, but to me it smells of oil like the mischief.' It was evident that neither of us could fully appreciate the brightness of each other's lantern, though we both tried."

The tuberculosis problem, as it has been developed at Saranac Lake, has been carried on from the first practically along the three lines which must in the future be followed,—namely, study, prevention, and treatment. In the town and at the sanatorium, by education of the invalid, by the health board's regulations, and the disinfection of infected surroundings, by the intelligent care of the very sick in the sanatorium infirmary, and in the boarding-houses and at the reception cottage, prevention has found its practical application. Treatment has made for itself a brilliant field in the development of the sanatorium methods and the application of these methods to patients in the town, while the study of tuberculosis in its scientific aspects has proceeded in the laboratory, in which latter department of the work increased knowledge must be hoped for in the struggle with this disease.

Thus in this remote Adirondack region has the problem been practically met. During their own work, Dr. Trudeau and his associates have witnessed the general spread of the new knowledge "and its application by others to the needs of great communities all over the land, the building of many private sanatoria, and the growing feeling of hopefulness which of late years has enlisted the co-operation of the State, the philanthropist, the medical profession, and the laity."

CHAPTER III

OTHER SANATORIA IN NEW YORK STATE

The establishment of private sanatoria has yielded most valuable service in the treatment of the disease.—*Maryland Tuberculosis Commission.*

THE Tuberculosis Infirmary on Blackwell's Island, New York City, affords an excellent example of what can be done in the way of sanatorium construction in the face of great difficulties. The need of a special hospital where the modern treatment of the disease might be carried out has long been apparent in New York City, where the number of consumptives vastly exceeds the limits to which such suffering can be accommodated in its general hospitals. For a long time the city shrank from the large initial expense necessary for establishing such an institution. However, in October, 1901, two buildings on the grounds of the Metropolitan Hospital for the Insane at the north end of Blackwell's Island became available through the transfer of the city's insane to State institutions. Here was an opportunity to establish without large outlay a hospital for consumptives, which was seized by Commissioner Folks almost immediately after taking office in January, 1902. These buildings could be adapted very satisfactorily. No large appropriation was available, although considerable alterations were required. The work was, however, begun by the hospital employees with the materials at hand. Soon the smaller, a structure of two stories, was put in condition to receive patients. The walls were painted, the floors polished, and the antiquated plumbing repaired. By the end of May, this building housed one hundred and eighty-three patients. Soon a part of these were moved into a portion of the much larger building, a three-story gray-stone structure, which had been renovated. The plan was to occupy one of the three floors at a time, leaving the others to undergo necessary alteration, until the entire building could be adapted to the purpose in view.

The larger building was altered in the following manner: There were no open wards, but single or double rooms, opening on a wide hall. This insured a certain amount of privacy to persons usually deprived of it in general institutions, and prevented the disturbing of some patients by the coughing of others. A clear stretch of three hundred feet of hall, ten feet wide, was made, at either end of which windows were placed, occupying almost the entire end wall space.

These windows added greatly to the light and ventilation of the entire floor. Next, all interior wood-work, all the doors and door-frames, were removed, leaving a series of open arches and rounded corners on either side of the hall, from end to end. The entire floor was thus made one large air-space. The cubic air-space per bed was about two thousand feet, and the entire interior was refinished, and given several coats of white paint. Most of the flooring was renewed and polished. There was a marked contrast between the gloom of the original building and the light and cheerfulness resulting from the renovation. The better spirits induced by the pleasanter surroundings more than compensated for the comparatively expensive renovation. The temperature at this institution is kept at sixty degrees; windows are constantly open. The situation on the north end of Blackwell's Island, between the two channels of the East River, is perhaps the best for purity of air and general healthfulness that can be obtained near the city. The value of this institution to the large number of its consumptives without resources for private treatment is incalculable. The patients have ample air-space on the hospital grounds. All the "bad cases" have been placed on the top floor by themselves in both buildings. This has certainly contributed to the well-being and good spirits of the stronger patients, who are thus completely separated from the depressing features of the ordinary hospital environment. A number of the cases, on becoming convalescent, have been put upon the hospital pay-roll,—an excellent policy, for the men are still under some medical supervision, and are not endangered by doing too heavy work, or such as is done under unhealthful conditions.

A platform, fifteen feet wide and one hundred and thirty feet long, has been built along the south side of the building, where patients may promenade when the ground is wet or damp, or be carried out in reclining chairs into the sun.¹

St. Joseph's Hospital for Consumptives is owned and conducted by the Sisters of St. Francis. It occupies an entire block, bounded by St. Ann and Brooks Avenues, in the Bronx Borough of New York City. Nearly all its three hundred beds are occupied by the sick poor, mostly "advanced cases," who are admitted irrespective of creed, race, or nationality.

The Riverside Hospital, on North Brothers Island, is maintained by the Department of Health of New York City, and is used as a tuberculosis hospital. Here, if necessary, such patients may be de-

¹ On dismissal the patients are provided with a list of medical suggestions with regard to their future well-being. (Appendix G.)

tained as appear to be a danger to the community through refusal to go to hospitals, or on account of persistent neglect of the necessary precautions against infecting others. When certain of these patients have recovered their health sufficiently, I understand such suitable work is offered them as is to be done on the Island, and they are put on the city's pay-roll.

The Montefiore Country Sanatorium was begun in 1897. In 1901 the present new buildings were opened at Bedford Station, Westchester County, on an elevation overlooking a beautiful valley. The grounds comprise one hundred and thirty-six acres, on which patients are let out to work at farming. Efforts have been made to confine the number of patients to those in the incipient stages of the disease, although no extreme line is drawn. At the time of its dedication this was the only free sanatorium for consumptives in the United States.



FIG. 66.—The Montefiore Country Sanatorium.

Partially cured patients are constantly being sent home. The land is becoming well-tilled, so that its productive power is constantly being augmented. There is sufficient pasturage for a herd of twenty cows, "and the crops of hay, rye, corn, and oats have been of superior quality, and the flourishing condition of the farm is a source of pride to all." There is also a prolific garden, from which fresh vegetables are supplied in abundance during the summer, and fine autumn crops are in anticipation to be stored for winter use. These results are achieved in large measure through the work of the more robust patients.

"The relations of the sanatorium and its officers with the citizens of Bedford and the surrounding country-side grow more cordial and neighborly as the nature of the mission of the institution becomes better understood. On the Fourth of July the inmates were treated to a fine Independence Day parade, with many well-conceived historic

floats. The procession was organized by the villagers as a testimonial of esteem and in appreciation of the good-will of the directorate for the inhabitants of the locality."

Dr. Rosenberg, the medical superintendent of this institution, declares that the number of cases classed as "not improved" would be very greatly reduced, and most of them ultimately transferred to the columns for "apparently cured" or "improved" in his classification if the large number of withdrawals against the advice of the staff could be prevented or lessened. This state of things is due to the insistent claims of dependent families or relations left behind in the city; to homesickness—sometimes unconquerable—and to the allurements of metropolitan life, particularly to young adult males.



FIG. 67.—The Montefiore Country Sanatorium.

The Stony Wold sanatorium is situated at Lake Kushaqua, Franklin County, New York. It is primarily intended for incipient cases among working girls. Some children are admitted. This excellent yet still very incomplete institution was formally opened in 1903. The president is Mrs. James W. Newcomb.

It is largely through the efforts of the "auxiliaries" that the buildings have been completed and equipped to the extent they are at present. Their total membership numbers upwards of twelve hundred and fifty. Several of these organizations have each undertaken the support of more than one patient; while one has four patients

as its guests, and another has started an endowment fund for the perpetual care of its room. The work being undenominational, all creeds are represented among the patients. There is a farm which it is intended will be systematically developed. Upon it many articles of diet required for the sanatorium can be produced for less than the market cost. The development of the farm will also make possible the establishment of a dairy.

Across the entire front of this institution is a very long porch, from which Mounts Marcy and Whiteface can be seen in the distance, with Lake Kashaqua lying just below.

The New York State Hospital for the treatment of incipient pulmonary tuberculosis began to receive patients on July 1, 1904. Dr. Trudeau selected the site at Raybrook, Essex County. Dr. John H. Pryor is the superintendent.

This institution was established in accordance with an Act of the New York Legislature.¹ The trustees are empowered to receive patients who have no ability to pay. Those only are admitted who have been for at least one year preceding the date of application citizens of the State. Every person desiring free treatment in this hospital must apply to the local authorities of his town having charge of the relief of the poor, who shall thereupon issue a written request to the superintendent for his admission and treatment. It must be stated in writing whether the patient is able to pay for his care, and all these statements are to be filed in a book kept for that purpose in the hospital. Whenever there are vacancies caused by death or dismissal, the superintendent issues a request to an examining physician, appointed in accordance with the terms of the Act, in the town from which the deceased or removed patient came, for the examination of another applicant from that town.

The Loomis Sanatorium, founded by Dr. Alfred L. Loomis, who died before the project was far advanced, is situated two and a half miles from the village of Liberty, in Sullivan County. The elevation is two thousand three hundred feet above the sea-level. The winters are dry, cold, and exhilarating; the summers cool and refreshing. Dr. Herbert Maxim King is the physician-in-chief. It has a school for nurses, the pupils of which have, to a considerable extent, been drawn from the convalescents. The purpose of this institution is to admit only incipient or moderately advanced cases, and the basis of treatment has been climatic and hygienic. It was the first institution to utilize the X-ray for purposes of diagnosis in pulmonary diseases.

¹ Appendix G.

The charges are ten to twenty dollars per week. No free patients are taken. There has never been any effort made on the part of the managers of this institution to make it a source of profit, but everything has been calculated to make it, if possible, self-supporting. There is a charitable annex which holds thirty patients at the rate of five dollars per week. The amount paid for medicines varies greatly with the need of the patients. This reduced rate does not cover the expenses of the



FIG. 68—Original lean-to at Loomis Sanatorium, eight patients.

annex, which has been met by means of contributions from outside. There are many more applications than the annex can accept.

Before discharge in those cases which are “apparently cured” or have their “disease arrested,” a system of exercise tests is given “in order to determine, if possible, the fitness of the individual for returning to his home and work,”—an excellent procedure.¹

¹ Concerning the lean-to used at this institution, see Appendix E.

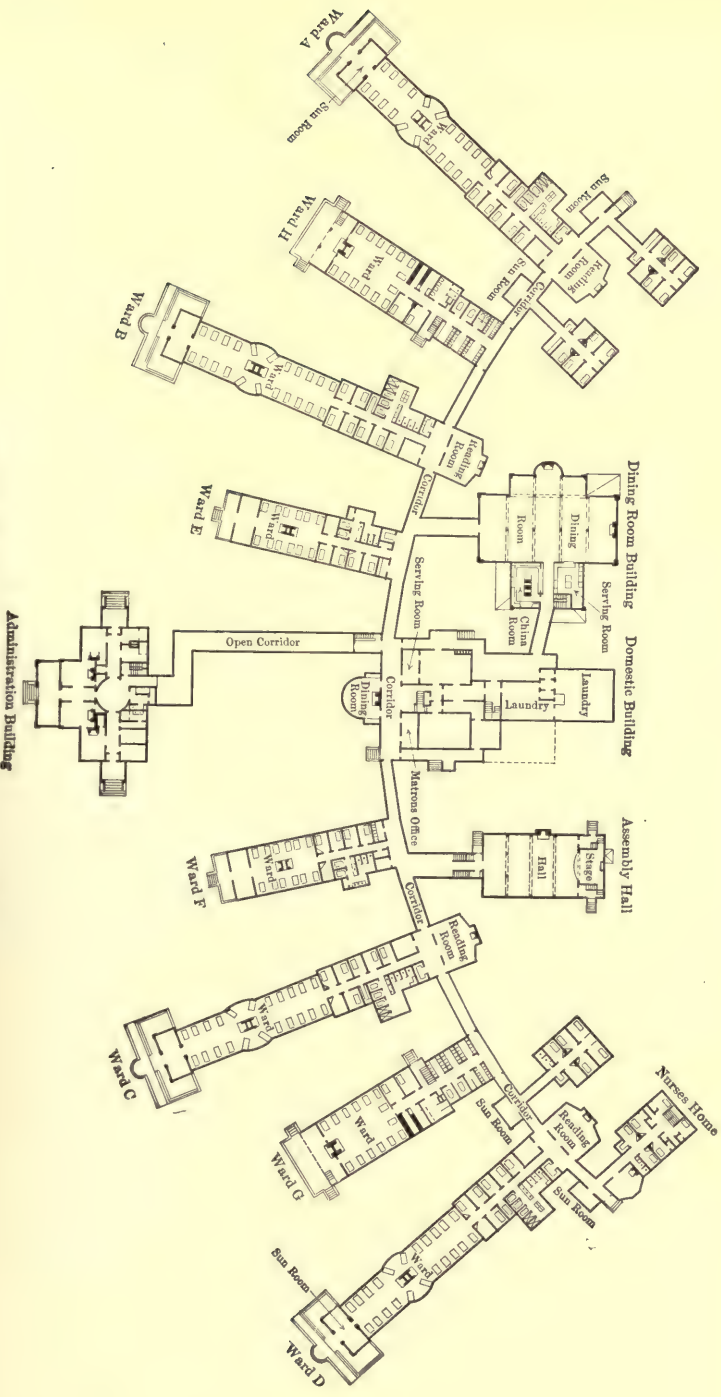


Fig. 69.—Block plan of the State Sanatorium, Rutland, Mass.

CHAPTER IV

THE MASSACHUSETTS STATE SANATORIUM

This institution "may be taken as a model for what may be accomplished in this line."—*Maryland Tuberculosis Commission*.

THE Massachusetts State Sanatorium at Rutland is upon ground twelve hundred feet above sea level. It is built on the pavilion plan and will accommodate about two hundred and fifty patients. The primary purpose of this institution is to arrest the disease, and, if possible, to extirpate it; therefore, only such patients are admitted as are deemed "not too far advanced to admit of reasonable hope of



FIG. 70.—The Massachusetts State Sanatorium.

radical improvement." It is not a home for the hopelessly sick; for, great as is the recognized need for homes of refuge for advanced consumptives, such service is manifestly incompatible with the even more needed service of rescuing lives that can be saved only by sanatorium treatment. For hopeless cases there should be separate hospitals, especially in the vicinity of great cities. Those who do not improve in the sanatorium after a stay sufficiently long to test the effects of treatment are advised not to remain, and their friends are expected to arrange for their removal to surroundings primarily devoted to or better adapted for their comfort.

There is a uniform charge of four dollars per week. There are no extra charges, and absolutely no tips are permitted. There are no

private patients and private rooms are allowed only for physical reasons. *Only* residents of Massachusetts are admitted. Drs. Vincent Y. Bowditch and Herbert C. Clapp, of Boston, are supervising physicians; and they decide the duration of the stay of patients. Dr. Walter J. Marclay is the superintendent. Examinations for admission are made in various cities in the State.

It is suggested to physicians applying in behalf of patients that only those be sent whom it is hoped to cure, or in whom there may be amelioration of symptoms sufficient to insure their becoming wage-earners again. "It is, moreover, an educational institution where the patients are taught the simple but important laws of hygienic living,



FIG. 71.—Taking the air at the Massachusetts State Sanatorium.

and as such is a factor in the foundation of preventive medicine." In order that patients with unfavorable symptoms may not have to make a long and distressing journey, only to find themselves ineligible for admission, physicians are advised that cases suitable for treatment are those in which there may be signs of incipient disease only. The physician would greatly facilitate matters by sending with his patient a record of his morning and evening pulse and temperature, taken for a week before application, together with a brief but careful statement of the physical signs and general symptoms in the case.

The average length of stay has been but six months for each of four hundred and eighty-four patients, exclusive of ninety-two who for

various reasons remained less than a month. Further accommodations for an increase up to four hundred patients are considered imperative ; as also new land and a barn, so that an economical supply of pure milk for the institution may be assured.

Provision has been made for the addition to the sanatorium of four brick cottages, two stories in height, to accommodate not more than thirty-five patients each. One of these cottages may be used as a probation ward, where about thirty newly received patients may be treated for a brief period, and the proper classification and treatment determined. Another of these cottages may become an infirmary for twenty or thirty patients during such days or periods as they may need treatment more nearly resembling that applied in hospitals. The estimate given in this report for the coming year was \$100,000 for maintenance, \$10,000 for an additional one hundred and thirty acres, and \$15,000 for a farm building.

In this institution a dietitian is employed, who is thoroughly trained in domestic science ; she also attends to many of the duties of a steward. Dr. Marclay considers that open wards are preferable to individual sleeping-rooms, not only upon grounds of economy of construction and administration, but also because the nurses have better control of temperature, ventilation and care of patients.¹

¹ Invaluable rules for the regulation of patients are set forth in Appendix G.

CHAPTER V

SANATORIA MAINTAINED BY THE UNITED STATES GOVERNMENT

The captain of the men of death.—JOHN BUNYAN.

OUR Government maintains two sanatoria, one at Fort Stanton, New Mexico, and another at Fort Bayard, in the same State. Dr. Paul M. Carrington is in charge of the former. Himself but two years ago a consumptive, he is now to the best of his knowledge entirely cured, ruddy-cheeked, and weighing some two hundred pounds.

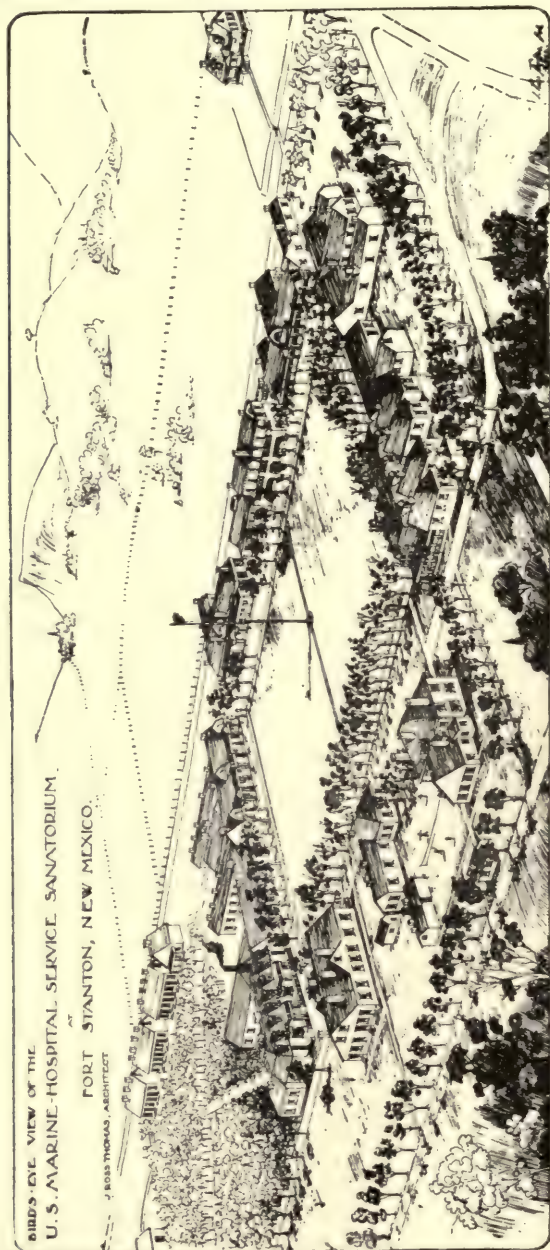
Fort Stanton, formerly a garrison post, is controlled and operated by the United States Public Health and Marine Hospital Service, one of the many bureaus of the Treasury Department. Seamen employed in the United States merchant marine, keepers and crews of light-houses, officers and men of the revenue cutter service, and the Coast and Geodetic Survey, and officers and men employed on Government vessels other than the Navy, may enter. Admittance is through the United States marine hospitals, which are maintained at practically every river, lake, and ocean port in the United States and among its possessions. In these hospitals are treated sick sailors, who are generally without homes or legal residence in any civic community.

From the marine hospital the consumptives, no matter in what stage, are sent at the Government's expense to Fort Stanton, where they may remain until cured; or, if they die, are decently buried. Thus does the Government vouchsafe to its wards relief and often permanent cure. And, in segregating them, it wisely diminishes the tendency to the spread of tubercular infection.

At Fort Stanton these men have rest, outdoor life, and nutritious food, by which their bodies may be strengthened to the degree of combating and disposing successfully of the bacillus and the results of its activity. An ample herd of dairy cattle is kept on the reservation; horses are bred; chickens, pigeons, hogs, and Belgian and other hares are bred and raised; and there is a herd of range beef cattle which, within a year or two, will supply all the meat required. A large tract of land is devoted to the production of hay, grain, and garden vegetables and fruits. It is expected that by such means as these this institution will in time become practically self-supporting. It has its own ice- and cold-storage plants, a fully equipped steam laundry, and a

modern system of plumbing, water-works, and sewage. The men are out of doors practically all the time. About half of them sleep

FIG. 72.



in tents, which are very popular; for cases in tents do better than those living in wards. The remainder have beds in specially ventilated

dormitories, which they are not permitted to occupy except when they are asleep. Their male nurses are required to keep them out of doors in the daytime. All the tents are floored, sided, and have small sheet-iron stoves; and every one of them was occupied during the whole of the winter of 1903-04, when the temperature was the lowest in many years. In only a few instances was it found necessary to remove tent patients to buildings.

At Fort Stanton the sun shines on an average three hundred and forty days in the year; and nearly every one of those days is pleasant enough to be enjoyed out of doors. The summers are cool; the winters mild. The altitude is 6,150 feet; the precipitation from but fourteen to seventeen inches, partly snow. All the year round the atmosphere is very dry. The heat is never enervating; and there



FIG. 73—Fort Stanton, New Mexico.

is always a cool breeze. The conditions for sleep—a great tissue-builder—are ideal. The temperature on winter nights is almost invariably at freezing-point. And low temperatures are beneficial for such patients. Dr. Carrington has not seen a case of pneumonia since the station was begun. The atmosphere seems free from pathogenic germs, and wounds of all kinds heal readily and without infection. Moreover, it is noted that on the appearance of winter mixed infection cases invariably lose their distinctive character.

The sanatorium consists of a group of buildings, constructed of stone and adobe, situated on the Rio Bonito (beautiful river), in a grove of cottonwoods and willows. The buildings are arranged on four sides of a square—"the parade ground"—which has been converted into a blue-grass lawn, contrasting pleasantly with the brown of the surrounding hills. In all this work are manifested the good

taste and ability of the architect, Mr. J. Ross Thomas, himself a "third stager." Upon the verandas and under the trees are invalid chairs. In winter the physicians require that the patients sit out of doors in the sun, in the lee of a building, perhaps. Reclining chairs may be seen, placed in several inches of snow, containing patients muffled from head to foot.

To occupy the minds of these men certain amusements are provided. Exercises tending to undue exertion and such as are exciting are guarded against. There is golf and croquet. An excellent library of books and magazines has been provided by Miss Helen Gould. There is no reading-room; all reading must be done out of doors. There are concerts in which patients proficient in entertaining take part. On the verandas cards, chess, checkers, and the like, are played. Periodical trips are taken, picnics for a day, or perhaps fishing or hunting parties, which camp in the surrounding mountains for weeks. Many patients are allowed to own and ride horses; many may do light work, such as weeding, gardening, distributing food, tending fires, etc. All are closely watched, however, by the surgeons in command, to prevent overfatigue.

Certain of these exercises have been found exceedingly beneficial by the physicians, breaking up adhesions as they sometimes do, and increasing lung capacity. There are breathing exercises, by which means practically all increase their chest expansion early in their stay, generally several inches. A difficulty encountered daily is that patients unaccustomed to restraint, except while aboard ship, soon tire of the essentially rigid regulations of sanatorium life. Alcohol is forbidden, except medicinally for appropriate cases. Many consider this a hardship not long to be borne by those who have been for many years steady and hard drinkers. (Whiskey is sometimes smuggled.) It is indeed difficult to keep men, accustomed as they are to the license of seaport, lake, and river cities, interested, amused and satisfied in this arid region. Unfortunately for the station's statistics, the men who leave to return to cities are usually those with fair or good chances of recovery; and some cases, favorable when discharged, have returned after several months only to swell the mortuary records.

The Fort Stanton physicians find that their patients, especially those who have had hemorrhages at sea level or in low altitudes, are less liable to this symptom after admission. They attribute this good condition to decreased barometric pressure.

Every effort is made to prevent the infection of healthy employees, and the reinfection of the cured and the convalescent. Sputum para-

phernalia, intended for destruction after use, are burned in brick crematories, several of which are located at convenient points on the grounds. Metal sputum cups are disinfected daily in a specially designed steam sterilizer. No patient can spit on the ground and remain at Fort Stanton. Here, as at Saranae Lake, the experiment of injecting dust from consumptives' quarters into guinea-pigs has afforded the same convincing demonstration.

It is essential to note Dr. Carrington's opinion that results in permanent febrile cases, especially those in which there is a wide range of daily temperature, are not better than in less favorable climates.¹

At Fort Bayard, an old army post, is located the United States General Hospital for the treatment of officers and men who have contracted tuberculosis in the service of the government. Up to the



FIG. 74.—Fort Stanton, New Mexico.

fall of 1903 this institution, which had been in existence six years, was under the direction of Dr. D. M. Appel, a major and surgeon in the regular army, who went to Fort Bayard a consumptive in the second stage. He is now on active duty in the Philippines, in very good health. At present this hospital is under the command of Deputy Surgeon-General Edward Comegys. Officers are sent to Fort Bayard on sick leave immediately tuberculosis is diagnosed. If their chances of recovery are good they are retained on the active list and kept at Fort Bayard until cured and able to return to duty. If the indications are that they will never be able to accept regular duty, they are retired for physical disability, and as retired officers are entitled to treatment in this hospital while they wish to remain there. The percentage of cures has been from 8 to 10 per cent.

¹ For results of treatment, see Appendix H.

CHAPTER VI

DENOMINATIONAL INSTITUTIONS

"I wish to make one statement, and I confess that I do it with a feeling of deep humility. As perhaps many of you know, I am interested in a summer home some seven miles from Raybrook. On learning that a State hospital for consumptives was to be established at that place, with many of my neighbors I began to protest. I have written minatory letters to the Governor on the subject. Doctor and Mrs. Newcomb have shown us here a different spirit. They have set us an example by bringing this institution to their own home. You can't serve your fellowmen unless you are willing to touch them."—BISHOP POTTER.

ST. JOSEPH'S SANATORIUM, at Silver City, New Mexico, is under the management of the Catholic Sisters of Mercy. Dr. Bullock is the medical director, and there is an advisory board of physicians of authority. It was established in 1901. The two buildings are arranged about a



FIG. 75.—St. Joseph's Sanatorium, Silver City, New Mexico.

court after the old California Mission style. The older structure is used for patients requiring special care. The newer is one story high and one room in breadth, with porches outside and inside, upon which each room opens by French windows. The result is really a succession of cottages, having all the advantages and none of the disadvantages of the cottage system. Each room has its fireplace. The main

building has a large recreation hall with many windows. There are arrangements for hydrotherapy, and a laboratory. The dining-room and kitchen, in a separate building, are reached by a covered way.

In the future, cottages in which families can be accommodated will be built around the main structure, so that the invalid may be accompanied by one or more members of his family. A "daughter" institution, designed for patients of limited means who can pay but part of the regular rate, will be created out of the profits accruing from the operation of this sanatorium. Thus the two sanatoria, both "closed" institutions, and under one management, will bear the same relationship to each other that Falkenstein and Ruppertshain do in Germany. An unlimited growth is not, however, contemplated for St. Joseph's. Patients must be few in number in order that their care may be properly individualized.

The sanatorium is outside the business centre of the city—a mining community—on rising ground protected from the prevailing north and west winds by hills, and overlooking a wide range of country beyond. The mountains of old Mexico are within sight. Fort Bayard is but nine miles distant. The climate of this region makes it ideal for invalids the year round. The altitude is 6000 feet, the average annual rainfall 12.3 inches, the mean annual temperature 54° F., the absolute humidity 46, the relative humidity 171. There are 37 cloudy days in the year, and the dew-point is 29. The air is dry and sterile.

Only such cases as present a fair prospect of recovery are received. The institution is for the cure of the disease; it is not an asylum for hopeless cases. Other than incipient cases are taken, however; for it is recognized that frequently long-standing tuberculosis is susceptible of great improvement or complete cure. Cases of persistently high temperature and uncontrollable pulse, or other symptoms of a progressively fatal nature, are excluded. Open-air life, rest in febrile cases, regulated exercises, driving, measured walks over known inclines, diet and hydrotherapy, with symptomatic medication, make up the treatment. The charge of \$100 a month is found to be the minimum at which St. Joseph's can supply the invalid's requirements. The advisory board may however recommend, to be admitted at \$75, such patients as are specially favorable for recovery. The number of these is obviously limited. Never, however, has any one been turned away. Monthly scientific reports are sent to the patients' home physicians.

Dr. Bullock considers that "if Silver City, climate and all, could be transported East, it would shortly become the most famous of sum-

mer resorts." He finds that patients do best in the fall, winter and spring months. Those who have done well in the winter will continue their progress during the summer. "Those who have failed during the winter will, as a rule, go all to pieces during the summer. As for new-comers, the contrast with the home climate is so great at any time of the year that they apparently do about as well in the summer, though they gain weight more rapidly as cool weather begins."

Dr. Bullock thanks Dr. H. M. King, the president of the advisory board, "who made the long trip across the continent for no other purpose than to assist at the birth of a new sanatorium." And a "great debt is due the Sisters of Mercy for their devoted services. In the face of every obstacle—and our discouragements have been many—they have been unswerving in their loyalty."

"The Home," of which the Rev. Frederick M. Oakes is superintendent, in Denver, Colorado, is conducted under the auspices of the Episcopal Church. Many professional men—doctors, lawyers, clergymen, teachers, students—whose salaries and incomes are cut off by failing health, live here, as far as may be, under the circumstances of life to which they have been accustomed, for at least one-half the price possible in any other place in Colorado. There are four buildings: St. Andrew's House, for men; Grace House, for mother and son, or husband and wife; the Emily House, for women; and Heartease for the very sick. They are connected by glass and covered porches,—“the cloisters.” From the porches, beyond vast plains, are to be viewed Pike's Peak, Mt. Evans, and Long's Peak.

The National Jewish Hospital at Denver had its inception in the following condition of things, as related in the statement of its Secretary: "Denver has always been the Mecca for consumptives. Hither thousands have hurried, from year to year, to seek the health-restoring properties of its wonderful climate. Many of them were sent by physicians anxious to be rid of such profitless patients. Poor they left, poor they came,—penniless, unknown strangers in a strange land. Unfortunately, unable to exist on air alone, they fared but little better in their new home. Without means, they congregated in the slums, in the close atmosphere of the river bottoms, of the smoke of the smelters and locomotives, and therefore were not benefited by the change. The little that could be done for them by the handful of Jewish people in Denver was unavailing, and many died for want of the necessary care who could have been saved; others more often for want of the proper food, and frequently without the touch or help of a loving hand to soothe their last hours. It was this condi-

tion which gave the Jewish people of Denver the idea of a hospital for consumptives,—a free institution for indigent sufferers. It required many years of unselfish, unremitting labor to gain even the first partial success. The men and women of Denver bore the brunt of the work; they carried on their shoulders the burden of raising money for buildings and maintenance; but it was simply impossible for a single community to maintain unaided an institution to take care of the sick of other cities.”

The building was soon raised; but for ten years it stood empty, until now it is “a monument of deeds, one that marks no creeds.” It is the one haven in that city where only the indigent sufferers may come. Under such conditions the hospital has become too small to answer the constantly increasing demands upon it, so that it has become necessary to limit admittance to those whose recovery may reasonably be hoped for. New buildings are sadly needed. The present building is but a wing of the originally planned structure. It is located far enough out on the plains to get the full advantage of the pure, sweet air; near by is the beautiful city park. There is from it an unrivalled view of the Rocky Mountains, a semicircular sweep of two hundred miles of the most picturesque mountain scenery in the world.

The features essential to a well-equipped sanatorium are here to be found. Expert physicians treat every phase of the disease. There is moderate diversion and entertainment,—cheerful and unrestricted social intercourse, games and music.

We observe again that no money or compensation whatever can be accepted from the patients. This hospital is absolutely for the indigent, and it has been truthfully said that the Jews of America have here “added another to the grand monuments that have marked the liberality of that race through all ages.” All officers, directors, trustees, physicians and managers, in fact all except the actual working force within the hospital, give their time and services gratuitously.

In a noble and eloquent address President Grabfelder stated: “It is pitiful in the extreme, and full of distress to those more closely brought in contact with suffering, when we are compelled to deny admission to worthy persons because of our inability to accommodate those who are justly entitled to our consideration;” and “when successful treatment has arrested the disease, to see the patient compelled to return to the very surroundings and conditions in which, in the first instance, he became a victim.”

It is noted that the financial condition of the married patients has generally been at a very low ebb. They are naturally anxious about

the condition of their helpless families at home, "but when this natural anxiety was stimulated by frequent letters from home, expressing distress and a longing for their return, it greatly retarded and often prevented recovery, and in many instances it so worked upon the patients that they left the hospital before it was safe for them to do so, resulting in complete collapse."

CHAPTER VII

CANADIAN SANATORIA

“I expect to pass through this world but once ; any good thing, therefore, that I can do, or any kindness that I can show to any one, let me do it now. Let me not defer nor neglect it, for I shall not pass this way again.”

OVER one thousand patients have been cared for in two Muskoka institutions conducted under the auspices of the Canadian National Sanatorium Association. It would certainly be difficult to estimate how effective is the influence that these patients exert after returning



FIG. 76.—Shacks at Muskoka.

to their own homes and communities in spreading intelligent information of proper sanatory and hygienic methods of living. The secretary of this association states in his report for the year ending September, 1903, that in three years the mortality in Ontario from tuberculosis has decreased nearly twenty-five per cent. The mortality from this disease for a number of years previously had been steadily increasing each year.

The Muskoka Cottage Sanatorium appears to be quite self-sustaining. The free hospital for consumptives, without an endowment to rest upon, has from time to time been in need of funds. However, this association has lived up to its record of never having refused admission to a single patient because of his or her poverty.

Prominent medical visitors from all parts of Canada and the States have greatly appreciated the splendid location, the thorough equipment, and the good results obtained at Muskoka. Dr. J. H. Elliott, the physician-in-chief, states that during the year ending September, 1903, sixty-one per cent. of the patients were discharged apparently cured. Of the advanced cases less than five per cent. were apparently cured.

In considering these results it must be remembered that patients are unable for various reasons to remain under treatment as long as necessary; otherwise results would have been even better. Of thirty-three far advanced cases treated an arrest of the disease was secured in seven. This is of special interest and importance, thinks Dr. Elliott, now that the Toronto hospital for advanced cases is about to be opened, showing as it does the great possibilities in the treatment of those usually looked upon as past help. A growing experience has shown that a fair proportion of the far advanced cases may be admitted with great benefit to themselves and without prejudice to the earlier cases under treatment, if a careful selection be made. "Of course, these cases can never be admitted to the exclusion of the more favored ones, and it is only possible to accept them when we have a number of vacant beds, our aim being as much as possible to maintain the sanatorium as a curative and educative institution, and not palliative."

Dr. Charles D. Parfitt, the physician in charge of the free hospital for consumptives at Muskoka, reports that during the year the real aim—to cure incipient cases—has had to be made subservient to the pressing needs of the public. A great number of hopelessly advanced cases were precipitated upon the hospital without any previous application for admission. For humane reasons they were not turned away. The responsibility for this large number of advanced cases, considers Dr. Parfitt, rests largely with the family physician, although he recognizes the impossibility of getting patients from the wage-earning classes with as early disease as from those more prosperous. But the family physician has it in his power to urge his patient to quit work and place himself in the sanatorium at a much earlier period than when he usually comes. The likelihood that a case will progress towards recovery should, in Dr. Parfitt's opinion, form the basis on which patients are admitted, rather than priority of application. If this basis were adopted a greater number would pass through the hospital with benefit quickly obtained, and the range of usefulness of the institution would be increased. Patients who are considered physically able have been given light work to do, either in or out of doors,

—an advantageous plan, as many have shown a marked improvement while being regularly employed. And the aim has been to find work for graduate patients who, being unable to remain longer as patients,



FIG. 77.—Shack at Muskoka.

are thus enabled to prolong their stay, live under sanitary conditions, and become at the same time self-supporting. To this end it is urged that if some industrial interest could be added to the hospital its usefulness would be greatly enhanced.

Part X
EUROPEAN SANATORIA

Tuberculosis primis in stadiis semper curabilis

BREHMER

CHAPTER I

ENGLAND

Give him air, he'll straight be well.—SHAKESPEARE. *1, 3, 3, 105*

IN 1840 George Bodington, "an obscure country practitioner," living in Sutton Coldfield, Warwickshire, England, published an essay on "The Cure of Pulmonary Consumption on Principles Natural, Rational, and Successful," in which he dwelt on the importance of a generous diet, fresh air day and night, together with systematic arrangements with regard to exercise and general treatment, and the watchfulness daily—nay, almost hourly—over a patient by a medical superintendent. He insisted on fresh air, declaring that cold is never too intense for a consumptive patient; the apartment should be kept well aired, so that it should resemble the pure air outside, pine air being used in the treatment as much as possible. There have been in England special hospitals for consumptives,—namely, the Royal Sea Bathing Infirmary for Scrofula at Margate, established in 1791; the Royal Hospital for Diseases of the Chest, in London, in 1814; and the Brompton Hospital for Consumptives, in 1841. But Bodington established in Sutton the first sanatorium in the world which was based upon the principles he set forth; and for several years previous to the publication of his essay, he had here practised these principles and had effected many cures. However, upon their publication, his views met with most bitter and contemptuous opposition. He was regarded as a lunatic; his patients were driven from his institution, which "by the irony of fate he was compelled to turn into an asylum for the reception of the insane."

In 1855 Dr. Henry McCormac, of Belfast, published a book on somewhat similar lines, and had "to bear every kind of persecution to which a man in his position could be subjected." In 1861 he advocated what are now established principles in a paper on the "Absolute Preventability of Consumption." At about this time the same doctrine was preached by Bennett, of Mentone, and by the late Sir Benjamin W. Richardson, who embodied his views in "A Sanitary Decalogue."

Now (1905) there are many sanatoria for consumptives in the British Islands—at Brompton, Ventnor, Cotwold on the Norfolk coast

—some seventy in all. The majority are, however, for paying patients, and there is urgent need of providing accommodation for the poor consumptive.

The Sherwood Forest Sanatorium, built by the Nottinghamshire Association for the Prevention of Consumption, is a wooden structure erected for workingmen at a total cost of £5300, about £220 for each bed. In this sum are included drainage, electric lighting, water sup-



FIG. 78.—Sherwood Forest Sanatorium. (Hillier.)

ply, roads, and all other sources of expenditure, much of which is incurred once for all. Consumptives of limited means in this county and adjacent districts are eligible. The institution is situated on a pine-clad slope, four hundred and seventy feet above sea-level, and facing a wide expanse of heather and bracken. There are fifty acres, half woodland, half moor, which are continuous with a wide tract of similar country stretching northward for miles towards Rufford and Edminstown. The building, on the edge of the wood, faces south-southeast. It is \perp shaped. A central block, containing offices, rooms of the staff, and some small wards, separate the male from the female wing. Each wing accommodates seven patients,—a private ward, bath, and cloak-rooms. Verandas running along both south and north sides of these wings enable the patient to lie on the side most sheltered from the wind in winter and the very warm sun in the summer.

“Several have slept there comfortably during the severe snowstorms of February,” writes Dr. W. B. Ransom, the honorable secretary of this association. There are now twenty-three patients, two nurses and four servants. There are two visiting medical officers who come

daily and are paid a salary. The corporation of Nottingham has contributed £1000 towards the sanatorium's funds; that of Mansfield, £200. The remainder has been contributed privately, and chiefly from those interested in individual applicants.¹

Among comfortably equipped sanatoria for paying patients of moderate means there is the London Open-Air Sanatorium at Wokingham, which stands in eighty-two acres of pine woods on the borders of old Windsor Forest; the soil is sandy, the altitude two hundred and fifty-two feet above sea level. The building stands in the centre of the grounds with an open glade immediately in front of it. There is a central administrative block, two separate bedroom blocks on either side of the central block, and behind a dining-room and kitchen block. There is a separate laundry. The bedroom blocks are divided into ground and first floor, the latter being reached by a wide and convenient staircase. All the bedrooms face south, and the windows open almost from floor to ceiling. There are sixty-four patients, each of whom has a separate bedroom. There are outside sun blinds and light inside curtains, hung at some distance from the window. Each bedroom contains, in addition to the ordinary bedroom furniture, a cane couch, on which the patient may rest quietly in his own room during the day. The dining-room is large and airy, with windows opening to the ground; the kitchen has every modern cooking appliance; there is electricity; the grounds are open to use of patients; there are open-air shelters, electric lighted. The staff is made up of a resident medical officer and an assistant. Two London physicians examine applicants. Patients pay three guineas a week.

The Ventnor Consumption Hospital, or "The Royal National Hospital for Consumption and Diseases of the Chest," was founded by Dr. Arthur H. Hassall in 1869 on the southeastern coast of the Isle of Wight. Originally formed of a single block it now consists of eleven or more, together with a handsome chapel. The climate is mild and the atmosphere, being practically that of the ocean, is germ-free. Its temperature ranges between 80° and 25° F. The site covers more than twenty acres "in one of the loveliest and most sheltered spots of the Undercliff." Each patient, no matter what his circumstances, has a separate bedroom. The houses are well sheltered from unfavorable winds, constructed upon sound principles of sanitation, and surrounded by gardens. There are large sitting-rooms, lovely landscape and sea view, plenty of light and sea air, effective ventilation, and good drainage. There is, however, an absence of verandas and

¹ For construction details, see Appendix F.

reclining-chairs. Those in an early stage of tuberculosis, such as afford a reasonable expectation of cure or of marked alleviation, are eligible. Each patient must pay \$2.50 a week in part payment of the cost of maintenance. The institution has an annual expenditure of \$55,000, the greater portion of which is raised by voluntary subscription.

Early in 1902 Sir Ernest Cassell gave to the King £200,000 to be used for whatever charitable purpose might seem best. It was decided to erect a sanatorium for consumptives; and to this end physicians were invited to submit essays and plans in competition for the erection of a sanatorium. Dr. Arthur Latham, in association with A. William West, architect, secured the first prize. In this essay the main principle enunciated was that the resistance of the body should by every possible means be developed so as to render the tubercle bacillus innocuous. Latham proposed the following modification of Brehmer's essentials to cure (Part X, Chapter V): There should be a continuous supply of pure air with no unnatural variations of temperature; the avoidance of reinfection and of all sources of irritation, such as dust; good, nourishing food in sufficient quantity to establish and to maintain the normal body weight of the patient; constant supervision by a skilled physician, who so orders the patient's life that he avoids everything which is harmful, and takes advantage of everything which helps the process of repair or develops the powers of resistance.

Dr. Latham's requirements for a sanatorium are the following: All patients must have comfortable accommodations, a separate room being provided for each; the sanatorium should be on an elevated and sloping site, with a sunny exposure, and well sheltered from cold winds; there should be a farm at a convenient distance; there should be extensive grounds, well wooded, and affording ample space for exercise of various kinds; the soil should be dry and permeable; the water supply abundant; there should be the latest sanitary arrangements and all essential scientific equipments; the ventilation should be such that the air contained within the rooms and passages is free from all sources of contamination and rivals the outside air in purity, whilst at the same time draughts are avoided.

The buildings should be so situated and so constructed that dust is avoided as far as possible; and the fittings should be of such a kind that inevitable dust can readily be removed.

Arrangements should be complete for the quick and effectual destruction or disinfection of all infected material.

The buildings should be so arranged that constant medical super-

vision can be readily exercised. The quarters of the medical men should overlook the grounds.

The bedrooms of the sexes should, necessarily, be in different blocks, but there is no necessity for separating the men and women in the dining-room or grounds. Four classes of patients must be provided for, both in the sanatorium and in the grounds: those who can take exercise more or less freely; those who can only take light exercise on level ground; those who must be isolated in their own rooms; those who, though unable to take exercise, may be allowed to associate with a few other patients.

The accommodation for visitors must be limited.

No provision, so far as the buildings are concerned, need be made for amusements beyond an entertainment room, which may also serve the purpose of a library; such games as billiards, golf, and tennis, which involve much movement of the arms, or lead to excitement, should not be provided.

A few open air galleries are of service, but nothing approaching the Liegehalle system should be erected.

The dining-room and kitchen should be completely cut off from the patients' rooms, but no separate dining-room need be provided for the regular staff; the kitchen should be very modern and thoroughly sanitary; the dairy and the farm should be of a model character.

There should be ample accommodation for hydrotherapeutic measures, with adequate laundry and clothes-drying apparatus.

The heating arrangements should be such that the temperature is never raised more than a few degrees above the outside temperature, so that no sudden variations are experienced when the patient leaves his room, and that the humidity of the air is not sensibly diminished. Adequate shelter should be provided in the grounds and elsewhere against wind, excessive sun, or heavy rain.

No special arrangements need be made for exercise under cover in bad weather, though it is as well to provide covered ways between certain of the buildings.

All facilities should be provided for the treatment and clinical observation of the patients by the aid of laboratories and special departments,—such as bacteriology, pathology, chemistry, physiology, and meteorology.

CHAPTER II

FRANCE

Speaking of the relative numerical importance of diseases in relation to child life, he (Dr. Menard, of Berck-sur-Mer) said, with a forgivable epigrammatical exaggeration, that there were but two which counted,—alcoholism in the parents, and tuberculosis.—*British Medical Journal*, June 11, 1904.

IN France there are isolated sanatoria, but the united effort has been directed—most nobly, as we have seen—towards combating the disease in childhood. Among sanatoria for adults that at Canigou is the first founded in France where the principles laid down by Brehmer and Dettweiler were carried out. This is now done with as much vigor as the peculiar arrangements of this institution will permit. There is here a gallery for the rest cure, situated several hundred feet higher than the main building, in reality a hotel, in which the patients take their early breakfast. They then proceed to the gallery. The next meal, an elaborate one, is served at noon in the dining-hall annexed to the veranda of the rest cure. There is also nourishment between meals. Towards evening the patients descend to dine at the hotel and to sleep there. Many of them are strong enough to make this trip on foot; the feebler ones go in an omnibus. Otherwise, the treatment is as in the German sanatoria. The patients rather like the change of going up and down, “this being a pleasant interruption to the rather monotonous mode of life in the sanatorium.” This institution is closed during the hot months. It is situated in a park of some sixty acres, well wooded, with chestnut trees, acacias, oaks and pines. Palms, aloes, olive-trees and cacti grow freely without artificial shelter.

The Boucicault Hospital was founded by the late proprietor of the Bon Marché; two of its five wards have been set apart for the hygienic treatment of consumptives. There are here certain beds reserved for the Bon Marché employees. During eighteen months one hundred and twenty-five patients have been under treatment, most of these suffering from the more advanced stages of the disease. The precautions against infection and against the dissemination of dust are said to be very complete. The patients are clad in aseptic dresses. Excepting on visiting days little or no dust is brought in from outside. The windows are kept open day and night, and twenty-two reclining chairs, with pillows of oats, have been provided in the garden for rest in the open air in tents.

At Bligny (Sein-et-oise) there is a *sanatorium populaire* which is a type of institutions for men only.

CHAPTER III

AUSTRIA

Zwei Dinge lern geduldig tragen :
Dein eignes Leid, der andren Klagen.

AMONG Austrian sanatoria is that established at Alland, some sixteen miles from Vienna, for the poorer classes, in connection with the hospitals of that city, whose citizens, in the main, subscribed the necessary funds. The site is of unusual beauty in a valley in the Wienerwald. The grounds, having a southerly slope, comprise nearly two hundred acres, and consist of woodland, meadows, and cultivated land in about equal proportion. The sanatorium is fourteen hundred feet above sea level; and about it the mountains rise to the height of two thousand two hundred feet above the sea, to the east, northeast and northwest; so that there is an absence of strong wind. There is but little dust. The soil is mainly limestone, with some clay. An aqueduct brings water pure and abundant.

There is a main building having a fresh air gallery running along its south side, and a glass winter garden in the centre. There are quarters for medical men who come to study the methods of treatment. Others besides this building are scattered in the park.

Patients are chosen at the general hospitals of Vienna, and are exclusively males in remediable stages. After a probationary period of three weeks they stay for three months. Certain among them are allowed to do gardening and other work suitable to their physical condition.

CHAPTER IV

SWITZERLAND.

Allen Menschen Recht gethan
Ist eine Kunst die Niemand kann.

IN Switzerland, as in Germany, there are many sanatoria. As in Germany also the organization is excellent and the results definite. At Davos Platz are several institutions. This region, situated in a high funnel-shaped valley, traversed by a little torrent, the Landwasser, among the mountains of Grisons, has an altitude of five thousand feet, an average rainfall of thirty-six inches, and a mean annual temperature of 37° F. The average is one hundred and fifty cloudy days to the year. The valley runs from northeast to southwest. In the north there is a high chain of snow mountains, and to the east the valley is protected by a strongly projecting mountain spur. To the south there are fields and pine woods. In an angle in the valley is Davos, which has a large population, many of whom are consumptives. For the latter, this town has some disadvantage, which inevitably exists in a fashionable health resort,—many consumptives congregate together with a mixed population of tourists and other invalids. There is skating, tobogganing, sledding, snowshoe running, and like sport, in the winter; and there are concerts and entertainments in crowded places to a degree which may be deleterious to the health of delicate persons. “Many of the consumptives there are scarcely, if at all, under medical control, and are apt to disregard the direction of their medical advisers, to their own hurt and possibly to the disadvantage of others.”

Here is situated Dr. Turban's Sanatorium. There is a fine view to the south and southwest over meadows and the town to the mountains beyond. A garden of seven acres, with walks at general gradients, adjoins the grounds of the Kurverein, to which patients have access on the payment of a subscription. Each bedroom in the main building has a radiator, capable of ventilation and having a ventilating inlet next to it; on the opposite wall is an outlet leading to a chamber under the roof.

The diet varies. One day it is *recherche*; the next it is simple in character. There are six meals a day. No advanced cases are admitted. There are extensive fresh air galleries; but afebrile patients

take a good deal of exercise in the open. The neighborhood is carefully mapped out in quarter-hour walking distances. Dr. Turban has established a class of "Prophylactiker," made up of the children of his patients, whom he educates physically and mentally, so that they may avoid the disease of their parents.

The Basel Sanatorium at Davos was founded for workingmen and poor patients by the *Gemeinnützige Gesellschaft* of Basel, on the initiative of the medical profession, and with the help of public subscriptions. This is one of some ten institutions devoted to a like purpose on Swiss soil.

In order to expose as little surface as possible to the cold air this sanatorium was built on a concentrated plan, of an L shape, instead of the extended one-sided arrangement common in the lowlands; it is in a very sheltered situation, being protected to the east and west by pine woods; the aspect is southwesterly.

To the west of Davos, in the valley of Arosa, at an altitude of six thousand feet, surrounded by pine-covered mountains, and near two beautiful lakes of clear water, a majestic sanatorium has been built. Most of the rooms face south and southwest and open upon a wonderful panorama. The view to the south is over meadows which rise to naked peaks in the distance; to the west are wooded mountain sides. A few rooms have balconies; every room has its own fireplace; in a covered veranda facing south are chairs for the rest cure; here the patients pass the greater part of the day. Many walks are taken over sunny meadows, or in the woods. The altitude here is higher, and the climate rather more stimulating, than at Davos.

This sanatorium is situated some nine hundred feet above the village of Leysin in the Canton de Vaud. It is well protected from the cold winds, and is in a pine forest. The air is calm; and the winds, which come rarely, are mostly from the south. From the terrace *Liegehalle* there is presented a beautiful panorama of mountains, forests and villages. Most of the one hundred and ten rooms have balconies. The equipments of the whole institution—furniture, carpets, curtains, etc.—have all been selected with a view to easy and thorough disinfection. Around the institution are numerous sun-boxes where patients may rest during their walks. This sanatorium is especially for French-speaking people. Patients of all stages are admitted, provided there is any probability of their benefiting by the climate.

CHAPTER V

GERMANY

Under the medallion of Brehmer at Goerbersdorf is this inscription (translated by Knopf):

Only the physician who has studied nature,
and has trained his mind in mathematical science,
knows how to cure men.

In Germany there are numerous institutions, and there is greater effort, better organization, and more definite results than anywhere else in Europe.

The folks sanatoria came into being in 1896. Eight hundred distinguished citizens formed a central committee, of which the Empress is the protectress, the Chancellor of the Empire, Von Bülow, is the honorary president, and General Von Pannwitz is the secretary. This committee began the work of erecting folks sanatoria, or Volksheilstätte (people's curing stations), which work has progressed so earnestly that there were in the summer of 1903 fifty-seven such institutions in full operation and twenty-six in process of building. Nearly eleven thousand consumptives are now thus accommodated in Germany. Some of these structures have been built by the Society of the Red Cross, some by railroad corporations, some by life insurance companies, some by individuals, and associations organized for that special purpose, and some by the Agricultural Insurance Society. Only incipient cases are supposed to be treated. These folks sanatoria are places for curing the disease. However, many second- and third-stagers gain admittance and are often benefited.

The erection and maintenance of many Volksheilstätte depend upon the workmen's insurance system of Germany. Of these institutions the Grabowsee Sanatorium is an excellent example, being conducted on economic lines for the benefit of the working classes. Originally erected by the Red Cross Society in 1896, it stands upon a hill among pine woods, about eighteen miles from Berlin. The site covers forty-eight acres, is twenty-five feet above sea level, on sandy soil. The land was obtained on a long lease, on a yearly rental of fifty marks. The sanatorium originally consisted of some two dozen light pavilions intended for use by the army, "Döckersche barracken." The walls were constructed of a specially prepared double layer thickened paper. The "barracken" were of various sizes, the wards accommodating eight patients each. These buildings have been gradu-

ally replaced by permanent structures of brick, wood and iron, and now accommodate one hundred and ninety patients, at a per capita cost of three marks a day. Only men—some private patients, others sent by insurance societies—are the occupants.

Dr. Dettweiler's sanatorium at Falkenstein has been since its establishment "the Mecca for students of modern phthisiotherapy all over the world." From a graceful appreciation by Dr. Knopf we learn that Privy Counsellor Dr. Peter Dettweiler took his degree in 1863. He was an army surgeon in the war of '70. During the performance of his duties he contracted consumption, and, resigning from the army, became a patient at Goerbersdorf. His health being restored, he became an enthusiastic assistant to Brehmer. In 1873 he published his first work upon the treatment of consumption, and after six years' service at Goerbersdorf founded the Falkenstein institution. Physicians from everywhere—many from America—visited this sanatorium, where they were heartily welcomed, and learned the methods pursued there.



FIG. 79.—Dettweiler.

Among many other achievements Dettweiler instituted the open air rest cure on the reclining chair. He founded the first sanatorium for the consumptive poor, which is situated at Ruppertshain; and it is to his initiative that Germany is now indebted for its many institutions of this sort. He was a charitable man, of unusual cordiality and kindness, yet strong in personality, stern and severe when occasion demanded. "His control of his patients was wonderful. He studied the soul-life of every patient; he was his friend, confessor and physician." To his assistants he was an ideal chief, always helpful and considerate.

Knopf quotes the following from an address delivered by this great humanitarian: "The medical director of a sanatorium for consumptives should not take upon himself the responsibility of such a posi-

tion unless he is fully prepared and honestly feels that he can excel his co-workers in strength, creative power, discretion, faithfulness, and duty. Otherwise, he is no better than a hired employee, too weak for the great and uplifting cause of service to his fellow-men, which at the end of this nineteenth century has grown to such great heights, and which promises so much for suffering mankind." Dettweiler died in January, 1904.

The first German State Invalidity Insurance Company undertaking the creation of its own sanatorium for its consumptive clients was the Hanseatische Versicherungsanstalt für Invaliditäts und Altersversicherungs, of Lübeck. A beautiful site was selected in the Harz mountains, on the slope of the great Oderberg, at an altitude of nearly two thousand feet. The mountains and woods are a protection against cold winds. The institution occupies an area of some nine acres. There is a main building consisting of a central portion and two annexes. Apart from this is a machinery-room and a laundry, the residence of the physician-in-chief, disinfecting and autopsy-rooms, and stables; and there is a building occupied by the employees and their families.

The bedrooms for patients are seven rooms with one bed each, fourteen rooms with two beds each, six with three beds each, and fourteen with four beds each. Besides these there are bedrooms reserved for patients to be isolated. The equipment of the institution is plain, comfortable and hygienic. The ventilation is wellnigh perfect; the heating is done by steam; the lighting is by electricity. There is an excellent water supply and a good drainage system.

In front of the building is a large covered gallery, and along the east and west sides of the house are the galleries for the rest cure and promenade exercises on rainy days. These galleries are twelve feet wide and more than four hundred feet long. There is a large square in front of the sanatorium, which, being specially protected against cold winds, is a favorite place for patients to promenade.

As to discipline, a certain number of patients select a foreman who is responsible to the physicians and the general superintendent (two distinct offices) for the carrying out of the general and medical directions on the part of the patients. The treatment is hygienic and dietetic, and the patients are sent to the institution immediately the medical examiner of the insurance company detects the disease. Dr. Knopf notes that the walls at Oderberg are ornamented with suggestive verses,—some of which grace the pages of this book.

At Goerbersdorf are the sanatorium founded through the generosity of Countess Pueckler, and that of Dr. Hans Weicker, both under

the direction of the latter. The former of these institutions accommodates thirty patients from among the "middle class." This small number is in accordance with the wishes both of the founder and of the physician, "who desire this sanatorium to resemble in a measure a family home." Dr. Weicker dines with the patients, and has inaugurated "zwanglose Vereinigungen,"—informal reunions where patients and physicians meet and where hygienic instructions are imparted.

The other institution—the *Krankenheim*—consists of various villas distributed throughout the village. These are exclusively for the poor, and only incipient cases are admitted, of whom the majority are sent for treatment by the State Invalidity Insurance Companies of Germany. These companies sent twelve patients in 1894, sixty-six in 1895, two hundred and fifty-six in 1896, and five hundred and twelve in 1897. There is a division for men and one for women. The inmates of each villa select a foreman from among their number who is responsible for the order in the house, takes each temperature twice daily and sees that all the directions of the physicians are faithfully carried out.

Honnef on the Rhine is protected against the cold north and east winds by the "seven mountains." Hohenhonnef, the site of the sanatorium, which was established in 1892 by Dr. Ernst Meissen, a former assistant of Dettweiler, is seven hundred and thirty-five feet above sea level, and is surrounded by a park. There are many promenades of various inclination, to suit the exercises graduated for the patients.

The main building is so constructed (the two wings forming obtuse angles) that nearly all the rooms receive sunlight for at least a few hours during the day, the majority having a southwestern exposure. The gallery for the rest cure extends along the main front, and has room for a hundred rattan lounges. There are douche- and inhalation-rooms, laboratories, drug-rooms, etc. Dr. Walters considers this probably the most luxurious sanatorium for consumptives on the continent. "There is, indeed, a little danger lest the internal comfort should tempt the patients to spend too much time indoors; but I saw no indication when I was there of such mistaken conduct, which is no doubt prevented by Dr. Meissen's watchful care."

Reiboldsgrün is picturesquely situated in a dense pine forest in the southern portion of Saxony, at an altitude of two thousand four hundred and sixty feet. The sanatorium has no habitations near by, and it is an hour's distance from the nearest village. The various buildings form a little village by themselves. The *Kurhaus* contains dining-rooms, parlors, music-room and kitchen. From the villa

Winterheim there are covered glass galleries which lead to rest-cure verandas, to the villa Wiesenhaus, the villa Hugosruhe, the Thurmhaus, the Karlsruhe, and the Mathildenuhe. There is a park of over five hundred acres. The surrounding country offers many opportunities for excursions. Dr. Wolff, the medical director, himself an accomplished musician, sees to it that frequent concerts and theatrical entertainments are provided. There is at Zoebisch, near by, a little colony of friends of patients residing in the sanatorium grounds, with a sprinkling of convalescent patients among them, who, while still under the doctor's care, have graduated from the sanatorium and no longer require strict supervision. Near the sanatorium is a natural spring containing iron salts, the water of which is utilized for the anæmic patients.

We have now, in a manner, reached a climax in the consideration of sanatoria. We are ready to appreciate Herman Brehmer and the



FIG. 80.—Brehmer at the beginning of his work.

truly magnificent results of his work. Being attracted by the ideas of that obscure country doctor in England to whom we have referred, Brehmer founded upon them the sanatorium treatment of tuberculosis. Like Bodington he had to meet much ridicule and opposition. However, he persisted in spite of this, and succeeded finally in convincing the world of the soundness and importance of the methods he elaborated. In 1859 he was permitted through the influence of Humboldt and Schönlein to open his sanatorium at Goerbersdorf in Prussian Silesia, which he raised from small beginnings to be-

come the largest private institution of its kind in the world, having a division for the well-to-do, one for the "middle class," and one for the poor.

His views were not, of course, generally accepted at once; "indeed, some of the grounds upon which they were based have since been shown to be erroneous." His work and that of his supporters, however—Rohden, Dettweiler, and Otto Walther in Germany, Sir

Hermann Weber in England, Blake and Trudeau in America—have established fully the value of the open-air treatment of tuberculosis.

Brehmer held that certain conditions, more especially a small heart, made people much more liable to tuberculosis. He observed that at Goerbersdorf there was hardly any tuberculous disease, and that the inhabitants had peculiarly powerful hearts. This he thought to be due to the air pressure at that altitude. He argued next that "anything which protects one man from falling ill must be able, if properly employed, to cure another of the same disease," and from this argument he evolved the following principles of treatment :

1. A life spent in the open air under conditions which give immunity from tuberculosis.
2. Complete freedom from any debilitating circumstances or anything which may lead to an exacerbation of the disease.
3. Medical hill-climbing as an exercise when the condition of the patient renders this advisable.
4. An abundant dietary in which milk, fatty food, and vegetables occupy an important place.
5. Various hydrotherapeutic measures.
6. Constant and unremitting medical supervision.

At Goerbersdorf the old and the new Kurhaus, in Gothic style, have dining- and small conversation-rooms, a reading-room with a mag-



FIG. 81.—The Brehmer Sanatorium.

nificent ceiling, a winter garden with fountains, all heated by a water-heating apparatus. The halls and rooms are amply ventilated by Kosmos ventilators and other means. There are covered balconies, verandas, Leigehalle, several villas, meteorological observatory, and a chemical and bacteriological laboratory from which has emanated much scientific work. These buildings are in a park of three hundred

acres, which has splendid trees extending to the top of the mountains.

In 1854 this sanatorium was established, and there was a semi-centennial celebration in 1904. *A propos* of this occasion Dr. Knopf wrote concerning the great debt which the civilized world owes to this man. After graduating in medicine he began to practise in Goerbersdorf, at that time a village of some nine hundred inhabitants. The hygiene established by Brehmer demonstrated that in a well-managed and well-equipped sanatorium one is less likely to contract tuberculosis than anywhere else. There are now some seven hundred consumptives living in the five flourishing sanatoria at Goerbersdorf (two of Brehmer, two of Weicker, and one of Römpler). Nevertheless, the mortality in the village is now one-third less than it was before these institutions were established, and the result must be ascribed in large measure to the perhaps subconscious imitation of the habit of

cleanliness obtaining in the sanatoria. The village has also gained in its economics; it is now one of the most prosperous communities in Germany and has trebled its population since 1854.

This great physician, who died in 1889, never received any recognition from the German Government,—no title or decoration such as means so much in that country. He had independent and democratic views, and was sturdy in their expression. However, a beautiful monument, recently erected in front of the sanatorium park, built by patients and physicians from all the world over, expresses the gratitude they



FIG. 82.—Brehmer.

feel. His was a striking personality,—imposing, energetic, with a beautiful head on broad shoulders and a patriarchal beard. He was “a true friend, an ideal physician, and a great and good man.” At the time of his death there were some three hundred sanatoria in Germany; and there are now many more of these, for the absolutely poor as well as for the affluent. And in many other countries—throughout the world, indeed—the number of these benignant institutions is constantly increasing.¹

¹ The works of Cornet, Knopf, and Walters contain lists of European sanatoria.

Part XI

THE SANATORIUM AND ITS ADJUNCTS

Let me conclude with a quotation from De Quincey, which puts in graphic language the question which so many generations have asked, and asked in vain, but which we have been permitted to answer in part, at any rate, and to answer in hope: "If you walk through a forest at certain seasons, you will see what is called a *blaze* of white paint upon certain *élite* of the trees marked out by the forester as ripe for the axe. Such a blaze, if the shadowy world could reveal its futurities, would be seen everywhere distributing its secret badges of cognizance amongst our youthful men and women. Of those that, in the expression of Pericles, constitute the vernal section of our population, what a multitudinous crowd would be seen to wear upon their foreheads the same sad ghastly blaze, or some equivalent symbol of dedication to an early grave. How appalling in its amount is this annual slaughter among those that should by birthright be specially the children of hope, and levied impartially from every rank of society! Is the income-tax or the poor-rate, faithful as each is to its regulating time-tables, paid by *any* class with as much punctuality as this premature *florilegium*, this gathering and rendering up of blighted blossoms by *all* classes? Then comes the startling question that pierces the breaking hearts of so many thousand afflicted relatives: 'Is there no remedy? Is there no palliation of the evil?' " It is one of the greatest triumphs of scientific medicine to be able to reply, Yes, the evil may be palliated and is rapidly being lessened, and for many, at least, a remedy has been found.

OSLER



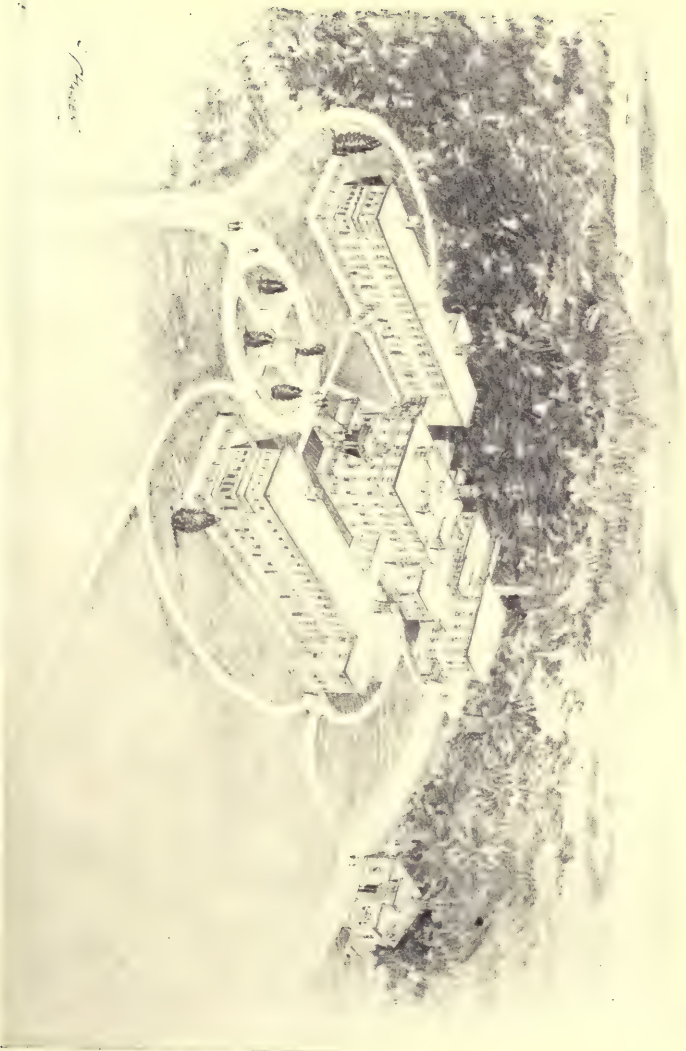


FIG. 83.—The Rhode Island Sanatorium.

CHAPTER I

THE SANATORIUM IDEA

“The following is the daily régime (in German sanatoria):

“At eight o'clock in the morning a domestic enters the bedroom of the patient and closes the windows, which have remained open all night. He lights a fire and serves the first breakfast. After this the patient arises and is comfortably arranged in a long chair something like a steamer chair, out of doors, generally on a protected porch. His legs and body are warmly covered and often a hot-water bottle, if the weather is cold, is placed at his feet.

“About eleven o'clock concentrated nourishment is brought to the patient: a glass of milk, some egg-nog, or bouillon. At twelve, luncheon, after which the patient enjoys a promenade, which varies according to the prescription of the physician. The promenade is made on a terrace or in a winter garden connected with it. Afterwards the patient resumes his place in the reclining-chair and passes the whole afternoon in a state of absolute repose. A quiet game of cards, dominoes, conversation, or reading, is not forbidden. Certain patients indulge in profound sleep, and care should be taken that this in no way interferes with the sleep of the night. Often at four o'clock nourishment is brought to the patient. After this dinner is served, and after dinner another promenade, shorter than that in the afternoon. The patient then returns to the reclining chair and remains there until ten o'clock in the evening, and then retires and sleeps in a flannel gown. The windows should be open all night. As patients improve they are allowed to take more exercise and prolong the promenade. In some of the sanatoria the beds are arranged on tracks, a plan which enables them to be wheeled out on the porch so that the patients can lie in the open air.”—LOOMIS.

SANATORIA, then, are ideal places for the care and treatment of people who are consumptive.

These institutions, when well conducted, are not a source of danger to the community in which they are placed. In fact, they come in the course of time to be very beneficent and really desired. The death-rate from consumption in such communities, rather than being increased, comes to be greatly lowered, for the reason that the measures against infection which are taught and enforced in well-conducted sanatoria, are learned by the population about them. Nor are the well likely to become infected in sanatoria; nor the patients to become reinfected in them. Dr. Trudeau declares that in nineteen years no nurse at Saranac Lake, nor any of the attendants or servants, had contracted consumption; and the dust taken from all the buildings of this institution, except in one instance, failed to infect guinea-pigs. I do not believe that results so favorable could be had from

any one of a hundred city dwellings taken at random one after the other. Moreover, those who have been cured of consumption in such institutions as these go out well-trained medical missionaries, teaching others the habits of sanitation and cleanliness they have accustomed themselves to.

We have found the communities of Goerbersdorf and Saranac Lake to be benefited with regard to material prosperity by their sanatoria; it has been, and is now, the same with Falkenstein. The sentiment of such communities may be judged by the results of the following inquiries:

Several citizens of Saranac Lake, the metropolis of the Adirondacks, were asked whether there is any prejudice against the institution on account of its nearness, one mile and a half, to the place.



FIG. 84.—The Agnes Memorial Sanatorium, erected by Lawrence C. Phipps as a memorial to his mother.

The reply, in every instance, was that no objection was felt, and, furthermore, that the sentiment of the community, after years of experience, might be measured by the fact that they have contributed many hundreds of dollars towards the purchase of land near the town upon which to erect a State sanatorium—the Raybrook institution.

Inquiries were also made in the town of Rutland, Massachusetts. The replies were all to the effect that no prejudice exists against the State sanatorium, which is located a mile and a half distant. The proprietor of the largest summer resort hotel there stated that the institution exerted no influence in keeping summer boarders away, but that, on the other hand, instead of being an objection, it is an advantage to the town.

The dangers from infection are certainly less in a sanatorium than in a city or town. And manifestly it is best for any city or town that its consumptives be provided for in some such institution where they will not infect their neighborhoods. "The consumptive hospital is a safeguard and not a menace to the public." And every reasonable community, without regard to humanitarian motives (though such

motives are manifest enough). but from purely selfish considerations, would find the establishment of hospitals for its poor consumptives to "pay," from nearly any view-point one may care to take of the situation.

Besides lessening the dangers of infection the sanatorium is by far the best place for the consumptive to be in. Here he is treated much more effectively and satisfactorily than at home. He has to obey strict regulations; the discipline maintained in these institutions is impossible in a home; he is constantly under medical supervision; his diet, mode of living, exercise, and his employment, if any, are constantly being regulated for him. And this is a great rest and comfort to the soul and body of any sick man, to have some one else



FIG. 85.—The townfolk of Bedford, New York, entertaining the patients in the Bedford Sanatorium on the Fourth of July.

plan his life for him, leaving him to do nothing but simply obey orders. "Very few families have any knowledge of the strict and constant measures that should be in force to insure safety from infection to other members of the family, and in almost all cases little or no precaution against the spread of the disease is taken, either by the patient or the family."

We have noted that in some sanatoria leaflets of instruction are given those dismissed, so that their lives thereafter may be ordered as much as possible in conformity with them,—an excellent measure which serves often to obviate a recurrence or a relapse of the disease. "Patients in a sanatorium learn discipline, and all who wish to carry out the treatment at home should first spend some time at a sanatorium to learn how to manage themselves, this being the most important thing of all."

The shortest limit of sanatorium treatment is three months, and most patients should stay six months at least, if permanent benefit is to be derived. In charitable institutions, where there are many applicants for each bed, it is best that there should be a period of probation during which the physician should determine whether the patient is likely to be made well by his stay, and if it be found that he does not do well under sanatorium treatment, he should give place to another whose cure may be assured. Even under the shortest terms but two or three patients can be accommodated for each bed



FIG. 86.—These patients at Bedford increased in weight as follows (left to right): 1, 23 lbs. in 4 months; 2, 22 lbs. in 5 months; 3, 15 lbs. in 3 months; 4, 12 lbs. in 3 months; 5, 10 lbs. in 1½ months; 6, 12 lbs. in 4 months; 7, 16 lbs. in 4 months; 8, 16 lbs. in 3½ months; 9, 15 lbs. in 2½ months; 10, 11 lbs. in 1 month; 11, 12 lbs. in 3½ months.

during a year. Under these circumstances it would seem best that only those who are likely to have their health restored should be given place.

What are the results of sanatorium treatment? These it is somewhat difficult to gauge. One set of reports is tabulated upon the basis of cure, arrest, improved and unimproved cases. This is not an entirely satisfactory classification for the reason that it is difficult to pronounce a case cured of tuberculosis. Many of the cases that are classed as "incipient," for instance, have no doubt had in earlier years attacks of tuberculosis. There are many patients who

have at one time or another in their lives, previous to their admission to a sanatorium, suffered symptoms which they have perhaps disregarded, or have forgotten, such as fever, chills, malaise, inability to work, and so on, which ill feelings they have attributed to a slight cold or to malaria or la grippe. Oftentimes such symptoms, from which they have recovered, have really been those of tuberculosis. Such cases might be classed in sanatorium reports as incipient cases, whereas they are really arrested cases of the disease. Then again, in institutions, all but incipient cases are rigorously excluded; in others there is wider latitude of admission, so that statistics would be correspondingly affected.¹

No particular climate is essential for the cure of consumption. The sanatoria we have considered are variously situated as regards



FIG. 87.—Sharon Sanatorium, Sharon, Massachusetts. Sun bath in winter.

altitude and latitude; some are by the seashore; most are in the mountains. Non-pulmonary tuberculosis (as in children) does extremely well by the seashore. The air here is certainly less germ-laden than it is inland. But most of those who have coughs and catarrhs are pronouncedly distressed by sea air; although some such patients are not, and do extremely well on ocean voyages. A dry inland climate is also apt to be comparatively germ-free. Many patients are doing well in Egypt, whither they have been sent, within

¹ Some sanatorium results are detailed in Appendix H.

a score of miles from the desert, where meat suspended in the air will not putrefy for many days. A high altitude also is much more germ-free; but the trouble here is that many, perhaps most, of those who breathe this rarefied air cannot again return to the denser atmosphere



FIG. 88.—Summer camp, Sharon.

of pretty nearly every subacute disease, not only organic, but functional and neurosal as well. One almost immediately feels a beneficent change, sleeping and eating better, and with a vastly improved sense of well-being. The consumptive feels this change in perhaps greater degree than any other; and oftentimes no patient needs more than he a change of environment. Still, Brehmer insisted, as does Trudeau, that a well-trained patient will do well in any climate, and that he will not be injured by inclement weather, provided he lives constantly out of doors. "It is not so much *where* the consumptive lives as *how* he lives that is of the most importance;" the consumptive "cannot be left safely to his own devices as to his mode of life in any climate. A life spent entirely out of doors, in any kind of weather, good and abundant food and rest, and discipline, are the all-important factors to utilize in bringing about a cure."

of their former homes; and a high altitude is dangerous in some heart conditions. Perhaps an ideal altitude for the consumptive is one of some twelve hundred feet, with many sunny, clear days in the year, as dry as may be, as free from dust and damp as possible,—one in which the patient may stay constantly out of doors. A change of climate, as every one knows, is good in the event



FIG. 89.—Same camp in winter, Sharon.

I again emphasize the equivalent of a criminal procedure of sending a patient ill equipped, both with regard to his bodily strength and to his funds, upon long journeys into places he knows not of, and

where he is not known. No patient with a fever or a rapid pulse should take such a trip. Before sending a patient away his character should be considered with regard to the place and the people among whom he is to go. If he is going to a health resort it must be learned what are its facilities for the cure of his disease, rather than those arranged for his pleasure and entertainment.¹

The question of recreation in a sanatorium is a practical one not always easy of adjustment. For instance, there should certainly be a library, but it is best not to have a reading-room; and the patients should be required to take their books out in the open. We have noted that in one institution cards are prohibited for the reason that they keep the patients so much indoors. This amusement, with checkers, chess and like games, should be played on piazzas outdoors.



FIG. 90.—Exercises at Bedford Sanatorium.

Croquet is an excellent game, requiring little exercise, and keeping the patients out of doors while it is being played. There should be provided in every sanatorium plenty of means of recreation, in order that the mind of the patient may be well occupied; for a variety of reasons this is essential. It may be possible to engage patients in recreations which may at the same time be profitable. There are now, for instance, classes in bookbinding, illuminating, and photography, under a competent instructor, at Saranac Lake. These employments are engaged in for but a part of each day. They divert patients and may give those who do not expect to return to their former occupations after their cure an opportunity to learn another and perhaps a more healthful vocation. There have been a number of remunerative

¹Stevens.

orders for binding books. The work is all done by hand. Several patients sell many views they have taken. About one-third of the sanatorium patients have enrolled in these classes.

We have seen that European sanatoria differ in some respects from American. The former are generally made upon the plan of a large central building in which is the dining-room and administrative offices, with wings leading out from either side, which contain the bedrooms and the baths, and along the front of which wings are broad piazzas. The basis of the American sanatoria is generally a central or administrative building, which is surrounded by cottages, each accommodating several patients. An essential in a sanatorium, in my opinion, is that in some way or other each patient may have a room, no matter how small, entirely to himself. No man can fairly



FIG. 91.—Sewing-circle at Bedford Sanatorium.

live his life, it appears to me, who has not some such place in lieu of the traditional castle in which he may—when he is minded to—preserve his individuality apart from the world about him. Other requirements of a sanatorium are that it should be built, if possible, on the south side of a hill, with woods near by, in which may be placed reclining chairs and summer houses. The soil should be dry and porous. There must be abundant pure drinking water. There should be a sight of water,—some sort of stream, or a lake. There should be graduated walks. Much of the land should be suitable for agriculture. It should be higher than the surrounding country so that it will be above the mists and the fogs of the lowlands. The ground leading from the sanatorium should be sloping, in order to insure drainage. There must be no ground-water. The sewerage must be

perfect. Railway communication should be so easy that supplies of all sorts may be had cheaply. But the site should be far enough away from any town to avoid dust and factory smoke. There should, if possible, be roof gardens and solaria. An infirmary—a ward, or, if possible, a separate building—devoted to the care of the very sick should be a part of every sanatorium. And, for the possible development of cases of acute infectious diseases, such as diphtheria and scar-



FIG. 92—Dr. Pottenger's Sanatorium, Monrovia, California.

let fever, a separate building should be maintained. This is important, that the consumptives shall not have their bodies taxed by other diseases in addition to the one from which they are suffering; but still more for the reason that the germs of these acute infections should not aid the tubercle bacillus in the formation of the "mixed infection" which makes consumption so serious a disease.

CHAPTER II

HOSPITALS AND HOMES FOR ADVANCED CONSUMPTIVES

“There is a rest.”

WE have observed that many sanatoria—in fact most—purpose to treat only incipient cases. This seemingly brutal course is in essence quite humane, and necessary under existing circumstances in this country. It is sought in sanatoria to make curable cases well, so that they may rejoin their families and take up again their life-work. Every good institution of this sort has a large waiting-list; and every incurable case it takes care of excludes, during the lifetime of that patient, perhaps protracted through years, several cases annually that might be cured.

The remedy for this state of things is to build many homes and hospitals for incurable and advanced consumptives. In this manner are these sufferers among the community's poor made as comfortable as possible while they live, and innocuous with regard to the health of the remainder of the community.

Every town or city should have such a home or hospital, and it should be adequately large. They should be suburban, these homes, not far from the community which maintains them; so that from time to time the patients may be cheered by the visits of their familiars. In the City of New York, for instance, there are some forty thousand poor consumptives for whom, as things are at the present time, the State or the municipality should provide. The noble charity, St. Joseph's Home, has room for but three hundred advanced cases. And this is by far the largest institution of its kind in the city, taking more cases than all the rest put together. Setting aside humanitarian aspects, on purely economic accounts, it is a governmental short-sightedness of an amazing sort that barely five per cent. of this number can be provided for in public institutions. This is not, in the case of New York City, the fault of the Health Department. The plan of this department to provide adequately for such conditions as these has until very recently been frustrated by the enactment of a State law in every conceivable respect degrading to American civilization.

It must be emphasized that the establishment of such hospitals and homes is by far the most important and essential of all com-

munal preventive measures against tuberculosis,—for the advanced consumptive is the most prolific disseminator of the infection; weak and helpless as he is, particularly if he be poverty-stricken and unattended, and emitting daily, as he does, billions of potencies by which this disease may be generated in others. “The most important of preventive measures is the prevention of implantations.” In these hospitals the advanced consumptive is scientifically taken care of, and his emanations are destroyed and rendered harmless. American cities most wofully lack such institutions, which should be distributed all over the country, one in every State; in every large city; a communal one for several towns. Every reader can figure out for himself that with regard to the tuberculosis situation the establishment of such structures is the best of all economies, both immediately and in the long run.

Particularly should consumptives be eliminated, in so far as may be, in such public institutions as almshouses or reformatories. Their segregation in insane asylums and prisons is now being attended to. When nothing better can be done, or pending permanent arrangements, consumptives should be housed in separate wards of almshouses and similar institutions. These wards should be the sunniest and the best ventilated, and so managed and equipped that there need be no fear of the spread of infection. Or tents might be erected on the institution’s grounds. And pending further measures, general hospitals should have separate and special wards for consumptives. Here, besides the advantage to patient and community, young physicians and nurses could receive practical education and training in the principles upon which the treatment of consumption is based. Many hospitals, however, are prejudiced against consumptives, because of an unnatural and unreasonable fear of the infection. What are hospitals for, in God’s name? “Our country is full of hospitals. If our hospital beds were counted and a census taken of our sick people of all kinds who cannot be cared for properly in their homes, it probably would be found that we have ample beds for all. Unfortunately, however, we would rather keep our beds empty than admit cases that do not suit. Formerly, the consumptive was excluded because he lived too long and would not get well; now he is excluded because his disease is contagious. Alas, that our pride should sow cockle in the wheat-field of our charity! We like to give aid in distress, but we like to give it where it brings glory. Our charity has built hospitals in great numbers and has provided hospital beds which easily would give relief to all suffering humanity, but we desire to see the people whom we put into these beds get well

quickly. For the short sufferer we have a welcome, but against the long sufferer we turn our faces." (Flick.)

In Germany there are Invalidenheime, several of which have been established by the State Workmen's Insurance Department.

In Paris the authorities requested the Société des Hopitaux to suggest the best means for prompt, practicable isolation of the tuberculous in the hospitals. It was recommended that certain quarters in the hospitals should be set aside for tuberculous subjects. They should, if possible, be in a separate pavilion; at least there should be a separate entrance. The dishes, etc., should be numbered for individual use of the patients, and sterilizing apparatus should be provided for the linen and spittoons. Subjects with recognized tuberculosis should not have access to the other wards. Each ward should have several beds isolated from the rest of the room for provisional isolation of the dubious cases. There should be some establishment to serve as a home for the surplus tuberculous; and the number in the hospitals should always be kept down by transferring the surplus, without further formality than a line from the physician in charge, certifying to the diagnosis and demanding the admission of the patient on account of the crowded condition of the hospital quarters.

In England the National Association for the Prevention of Consumption has published a leaflet upon Homes for Advanced Consumptives, in which it is observed that those who are admitted to sanatoria in the latter stages with extensive consolidation or with consolidation and much fever, usually die within a year after their discharge. For such cases a distinct home should be provided. It was, therefore, proposed at a meeting of the committee of the Westmoreland Consumption Sanatorium that a conference should be sought with representatives of the County Council of the ten sanatoria authorities in the county and of the Boards of Guardians for the purpose of discussing some practical plan of dealing with those in the county who should be suffering from consumption in too advanced a stage for admission into the County Sanatorium and who were without adequate means of isolation at home. At this meeting the importance of isolation in such cases was recognized, and it was agreed that steps should be taken to establish a hospital to this end. An Isolation Hospital Act was passed, which constituted the whole county into a hospital district and elected a hospital committee. As a result much useful matter was set forth to the following effect: While tuberculous dust cannot be found in even the dirtiest houses in which consumptives have not lived, it is found in two-thirds of the dirty houses, and in one-half of the fairly clean houses occupied by con-

sumptives, especially in those structures which were badly lighted and badly ventilated. And it has been found that persons in houses adjoining those occupied by consumptives get infected apparently by the sweeping out of accumulations of tuberculous-infected dust. Every case of advanced consumption in a small crowded dwelling is necessarily a dangerous source of infection. These most dangerous cases are generally rejected from sanatoria, which admit cases only in the early stage, when the disease can be arrested. These sanatoria are available chiefly for preventing cases reaching the infective stage and for training patients to manage their sputum. Some other home besides a sanatorium is then indispensable. Very many consumptives pass into the hopeless stage before they are discovered. Advanced consumptives eagerly enter such homes, and the association cites institutions which have waiting lists of many applicants.

During fifty years past London has been segregating its consumptive poor in hospitals. To this plan is largely due the fact that, the largest city in the world, it has the lowest death-rate from this disease—about two per thousand.

CHAPTER III

FARM AND OPEN-AIR COLONIES

During the spring, summer, and autumn this work (at Bedford Sanatorium) has been largely in farm, garden and orchard. The supplies were far beyond the needs of the institution, and the prize pumpkins, cabbages, radishes and ears of corn would have done credit to a country fair. The value of such a *régime* to the patients themselves (selected incipient and convalescent cases, to whom outdoor work could be given) is simply inestimable. The outdoor life it encourages, the training in a useful and healthful occupation, the stimulus that comes with something accomplished, the reduction of the hours of loafing and brooding, all tend to the betterment of the patient, both physical and moral.—ALFRED MEYER.

It is often a vexatious problem how to find occupation for consumptives who can do some light work commensurate with their



FIG. 93.—Inmates of Bedford Sanatorium at work.

condition ; for those whose disease has been arrested, even temporarily ; for those whose health has been restored, and whose return to former unhealthful occupation such as stone-cutting or sweat-shop work, is sought to be avoided. Moreover, one of the difficulties of the sanatorium life lies in the lack of occupation, as we have seen.

It is advisable that every sanatorium should have, for such of its inmates as are able, perhaps for but two or three hours a day, some light vegetable or other farming work to do. And for graduates of sanatoria, farm or open-air colonies have been and should be estab-

lished, where work of a salubrious sort may be done. Such a colony, living under proper sanitary regulations, vigorously enforced, cannot harm any community.

In the West this difficulty of getting suitable work for sanatorium graduates is emphasized by the officers of the Jewish Sanatorium at Denver. Many of the discharged cases must perforce remain in the high altitude of the Rocky Mountain zone. It is very painful to see such patients compelled to return to the very surroundings and conditions in which, in the first instance, they became victims of the disease. And one of the most serious problems which confronts this institution is what to do with cured cases who nevertheless require "the preparatory course" to fit them to return to the active duties of life. The purchase of a farm has been advocated near the hospital in which light work could be done. However, it is pertinently observed that very few sanatorium patients are willing for or suited to



FIG. 94.—The Y. M. C. A. health farm, Denver, Colorado.

agricultural pursuits; so that the cost of supervising such a farm has been found to exceed what the patients could earn. Such deficiency should, however, not be a deterrent factor. The Denver Young Men's Christian Association has established a health farm at which many of the consumptive young men who have flocked to that region from all parts of the country, and for whom sanatorium accommodation could not be found, find employment. There are on the grounds forty-five Tucker tents, one for each man. There are two tracts,—thirty-four acres of fruit land, and sixty acres of unimproved land. Besides the tents there are an administration building, a water-tower observatory, and a tent hospital. The patient pays \$25 a month. Light work in partial payment of this charge is provided as much as possible.

Forestry is advocated as being of all occupations the best for those

who have had consumption. It is an ideal outdoor occupation, fairly remunerative. "The demand for its products must increase in an arithmetical, if not in a geometrical ratio, in the years to come," states the Ohio State Tuberculosis Commission, which has investigated the matter. This body sent a circular letter asking for definite information concerning what employment might be provided for convalescents. Some thirty replies established, first, the economic value of a cured consumptive's labor. This was thought to be equal in laboring capacity, at the start, to about one-fifth of that of a normal workman. Second, they definitely placed the responsibility for the effects of the labor upon the laborer. The medical director of the institution should be the daily arbiter of any who may or may not labor. Third, they decided the minimum time that employment should be given, which is six months; two years may be taken as a limit beyond which it would seem needless to go.

Labor organizations may establish farms for consumptive union workmen in various parts of the United States. These, if the plans mature, will be located in North Carolina, the Adirondacks, in the Middle West, and on the Pacific coast.

A phase of the situation, as it appears in the work of the French hospitals for tuberculous children, which we have noticed, is the unwillingness of children who have graduated from these institutions, to do light farming and outdoor work, and their preference for returning to the slums from which they had to be taken when they were ill. It certainly is a strange phase of human nature when, having once tasted the sweet and wholesome pleasures of the country, one should wish ever to return to the squalor and the unhealthfulness of city life. At Villiers it was recognized that patients who return to unfavorable surroundings are likely to develop again the symptoms they have thrown off. A *colonie* has therefore been established where convalescents are admitted and taught farming and gardening. Great hopes were entertained that this would be a means of attaching young lads to a country life and of getting them away from hurtful town surroundings. Unfortunately, it has been found almost impossible to retain them. The town influence has been found too strong in them, and they never settle down happily to country life. At Noisy-le-Grand, where only girls are cared for, a similar endeavor has been made, with no better success, and for the same reason.

In England, Hillier notes that cured cases, and even advanced cases, whose disease is arrested (a condition which may be rendered permanent by the continuance of an open-air life on radical lines, but which is almost certain to relapse if a crowded city life is reverted to)

should find light occupation in industrial colonies, which would be under medical supervision. For other chronic diseases, as epilepsy, which is much less common than tuberculosis, industrial communities have long been established. With tuberculosis, as with epilepsy, it will be found that by taking a patient from his home not only are his own prospects of health and life much enhanced, but a grievous burden is lifted from his family, and the danger of infection is removed



FIG. 95.—Nordrach ranch, Colorado Springs, Colorado.

from them. Moreover, he can be more conveniently and economically treated in a community of patients.

One of the conditions essential for the admission to such a colony should be a period of at least a few months spent in a sanatorium where a consumptive would be carefully coached in the precautions necessary for disinfection and the principles of the open-air life. The lighter kinds of outdoor work, horticultural, and the keeping of poultry, pigs, or bees, would be appropriate. Patients would have to be prepared to rough it to a certain extent; to wait upon themselves and dwell in simple, inexpensive barracks, pavilions, or cottages.

CHAPTER IV

TUBERCULOSIS IN INSANE ASYLUMS

Asylums for the insane should take the first place among State institutions with regard to the regulation and control of tuberculous patients.—BRACKEN.

It seems that a disproportionate number of the insane develop tuberculosis during their stay in asylums. One account states that in seventy-four consecutive cases of pulmonary consumption, in ages between twenty and sixty-two years, only three had evidence of this disease before admission to these institutions. It is furthermore observed that those who enter an asylum with tuberculosis have little chance of recovery while they are inmates.

It seems that tuberculosis is apt to follow insanity. It does not precede the latter. Several phases of life among the insane, which do not obtain in normal circumstances, would explain this conditions of things. Many will not complain or tell of their symptoms, and thus do not for a time manifest tuberculosis. Indoor life, even cell life, is essential for many of them. The insane who can be permitted to be out of doors do not seem particularly prone to consumption. Many are careless in their habits, and their mentality is such that they cannot comprehend instruction in prophylaxis concerning their disease. There is a great deal of opportunity for infection, because of the carelessness of the sufferers concerning their sputum, and of the intermingling of the consumptive with those who are not so. Then the tissues of many asylum inmates are apt to be vitiated and of lowered tone, so that they are predisposed to infection, tubercular or otherwise; this is particularly so of the melancholic and demented types.

Cornet would explain the frequent occurrence of tuberculosis in sufferers from psychic disorders, especially where there is deep depression and an apathetic stupor, associated with a reduction of the vegetative functions, by the reflex excitability to inspired particles of dust. Grashey finds that the insane who get about and do their work are no more subject to disease than are the healthy. Von Ziemssen declares that nuns who keep to the cloister are more apt to become tuberculous than those who have their work outside the wall. Increased mortality is due to opportunity for infection in such life. S. Solis Cohen cites Laennec's instance of a French religious order,

showing that depression had much to do with the extinction by phthisis of all the nuns other than those whose duties kept them in contact with the outer world.

Bracken finds that the feeble-minded frequently develop tuberculosis of the intestines, these individuals being in the habit of swallowing their sputum. In insane asylums two sorts of tuberculous subjects are encountered,—those who have suffered from the disease before their admission, in whom the condition progresses slowly, and those who become infected after admission, in whom the disease progresses rapidly.

Dr. James Greenwood, of the Southwestern Insane Asylum, Texas, considers tuberculosis by far the most serious of asylum diseases. Its course is rapid in these institutions. In all situations, in fact, where people are confined, as in religious orders or by the requirements of law, tuberculosis has become a very serious problem. The asylum with which this observer is connected has a tuberculosis record of 21+ per cent., or eighty-five among three hundred and ninety-two deaths during the twelve years of its existence. Nine-tenths of such patients are between twenty and fifty-five years of age, and eleven-twelfths of the deaths from tuberculosis are found to have occurred during these years.

The total death-rate per thousand in the United States for this period is about ten, of which 4.4 to 4.8 are due to tuberculosis. In this asylum for twelve years past there has been an average yearly death-rate of thirteen per thousand among the inmates due to tuberculosis alone. This is three times as many as are caused by tuberculosis in the United States within the age limits stated. During the first three of these twelve years, for which these statistics were made, there were no deaths from tuberculosis, but as the wards became infected the death-rate from this disease increased until it has averaged eighteen per thousand for the last five years of the twelve. The average length of time in the asylum of those dying from tuberculosis has been three and one-half years. During the last twelve months investigated by Dr. Greenwood there were on the female side twenty-nine deaths, of which nine, or 30 per cent., were due to tuberculosis. Six of these nine cases contracted the disease in the ward where the most demented cases were kept. Of these nine cases eight were dementia, in which form of insanity the vitality is lowest. During these twelve months there were on the male side twenty-eight deaths, of whom eight died of consumption. All of these eight cases were of dementia.

Dr. Greenwood considers that there should be a special hospital

for tuberculous insane, so built that these patients will be given plenty of fresh air, while at the same time the structure may be easily cleaned and disinfected.

Another important measure would be the enactment of a law requiring that all cases admitted must be free from tuberculosis, as the law now requires them to be free from other contagious diseases.

Since 1901 consumptive insane patients have been separated and treated, to their own great advantage, and incidentally to that of their non-tuberculous fellow-inmates, in canvas tents, throughout the four seasons of the year, at the Manhattan State Hospital, East, New York



FIG. 96.—Tents on Ward's Island, New York City. (Courtesy of Dr. J. T. W. Rowe.)

City. Before that date Dr. A. E. McDonald found the problem of caring for this class of patients a serious one, especially because the form of construction of the hospital buildings was such that no smaller wards or sections were available for their isolation.

An experimental camp was therefore established, consisting of two large dormitory tents, 20 by 40 feet, each containing twenty beds, with smaller tents of different shapes for the accommodation of the nurses, the care of hospital stores, pantries, and a dining-tent for such patients as were able to leave their beds and tents for their meals. It was originally intended to continue the camp only through the summer, but when in the autumn it was found that the favorable experience continued, it was decided to carry the experiment, on a

modified scale, into the approaching winter. The camp at first had been placed upon an elevated knoll, properly exposed to the full force of the summer breezes. For the winter its site was removed to the centre of the island, where hills and buildings acted as a wind-break. The number of patients was reduced to twenty,—those most ill being retained and the others being returned much against their will to the buildings. In the accessory tents above mentioned large stoves were built with wire screens surrounding them to protect the patients, and with asbestos and other fire-proof material for the prevention of fire. Slatted wooden movable pathways were prepared, which might furnish means of passage between tents when the storms should come. It was found that despite high wind and bad weather a more equable



FIG. 97.—Tents on the grounds of the Manhattan State Hospital, East Ward's Island, New York City. Revolving tent in foreground. (Courtesy of Dr. J. T. W. Rowe.)

temperature had been maintained and less discomfort had been experienced in the tents than in the hospital wards most exposed to the force of the gale. This tent camp, in which all phthisical patients with active manifestations are isolated, has remained in continual use through the succeeding winters and intervening seasons.

Among the results obtained are the reduction to a minimum of the danger of infection to other patients and to employees. The patients themselves have suffered no injury or hardship, but have on the contrary been unmistakably benefited. There has been a decrease in the death-rate, both absolute and relative; a marked general increase in bodily weight (amounting in the case of one patient

to an actual doubling of weight, from eighty-three to one hundred and sixty pounds), and mental has, as a general rule, been the concomitant of physical improvement among the patients in this camp. "Common colds" were here unknown during the winters.

Dr. McDonald makes the observation that where phthisis and insanity coexist they are apt to alternate as to the prominence of several manifestations,—the mental symptoms being more pronounced while the physical are in abeyance, and vice versa. Under the tent treatment he has found a general disposition toward accord in the manifest improvement in both respects, proceeding concurrently; and some of the discharges from the hospital, which gave most satisfaction at the time and most assurance for the patient's future, were of inmates of the tuberculosis camp.

This innovation was, we believe, the first adopted by a hospital for the insane, and is said also to be the first instance of a continuous system of tent treatment anywhere. The results have been so encouraging that steps have been taken to introduce the same system in other hospitals in New York City, in the Ohio State Hospital at Columbus, the Protestant State Hospital for the Insane at Montreal, Canada, the Vermont State Hospital at Waterbury, the Eastern Maine Hospital at Bangor; in the States of California, Delaware, Louisiana, Maryland, Mississippi, Ohio, Rhode Island, Virginia, and elsewhere.

CHAPTER V

TUBERCULOSIS IN PRISONS

A separate hospital building of sufficient capacity to accommodate all its prisoners suffering from tuberculosis, provided with properly fitted wards, modern sanitary appliances, and outdoor and indoor exercise courts, isolated completely from the prison population proper, presents without question the solution of the problem of the treatment and prevention of this disease in the penal institutions of the State.—RANSOM.

MANY factors in prison life are peculiarly conducive to tuberculosis. Most prisoners have before incarceration lived wretchedly amid unsanitary conditions. Cells are traditionally dark and unwholesome. Prison fare is poor; seclusion is enforced; there is comparatively little exercise allowed. Sing Sing prison has, rightly enough, I presume, been termed a veritable tuberculosis pest-hole.

Dr. J. B. Ransom, physician to Clinton Prison, in New York State, points out that a criminal class is essentially a part of the community, as much as is any other. Society is morally as well as lawfully bound to conserve the convict's health during the incarceration to which it has subjected him. But for other reasons than this it should be interested in the welfare of penal populations, which are always tidal. The three institutions in the Empire State are discharging annually about twelve thousand, among whom women are in a very small minority. The prisoner should be dismissed with a degree of health which will at least prevent his becoming a public menace and burden. This is particularly essential with regard to tuberculosis, to the development of which a prison life and environment are very favorable. From forty to fifty-five per cent. of all the deaths occurring in the prisons of the world are due to it. In many isolated cases the percentage has been much higher,—even eighty at one time; in New York State it has reached seventy-five per cent.

This high mortality is, of course, not due entirely to prison environment. Yet most of the cases are thus engendered, because of the unsanitary structural arrangement of nearly all the prisons of the past, and many of those of to-day. They are damp and often much overcrowded; they lack sunshine and fresh air from out of doors. Then there are the age (that of convicts on commitment averages

about thirty) and sex, and the physical and mental strain occasioned by the confinement and the necessary discipline. The nervous system of the prisoner is almost always unstable.

The discharged prisoner is somewhat more dangerous than the ordinary citizen, in that he is likely to return to crowded and unhealthy localities, and to be wilfully careless about his personal habits. His capabilities for infection, if he be a consumptive, are rather unusual. So that the State cannot afford, as it should not permit, predisposing conditions to exist in any of its prisons.

The consumptive prisoner should be as well taught as regards personal hygiene as the graduate of a sanatorium. Many cases can be cured in prison, where some conditions should be especially favorable; these patients are more than usual under control, and must submit to necessary instruction, sanitary rules, strict isolation, ward and outdoor treatment, and like measures.

The exercise of such functions as these by the State is neither sentimental nor paternal, but a legitimate, reasonable prerogative inherent in constitutional governments. The State's authority to commit a man does not imply oblivion for him, unless he be given a life sentence or the death penalty. After short terms he is supposed to return to society more or less bettered. The State is bound, if only by self-interest, to assume the relation of guardian toward the prisoner. Therefore it should protect him from incapacity engendered by disease, even more than should non-criminal communities, which are so largely supplied with municipal and town regulations.

The State of New York is now taking action to better the condition of its consumptive convicts. In 1889 tuberculosis prevailed greatly in Clinton Prison. There was no means of caring for these sick; no isolation, bathing, or feeding; no treatment, no precautions. There was no distinction between the consumptive and the well; "they locked, worked, and ate together." When in hospital they were mixed indiscriminately. Through a vicious State law concerning prison work, these unfortunates were largely idle. Practically "the only saving element in the past, which had acted as a preventive to almost utter annihilation of the population, was the large amount of outdoor labor which was afforded the men by the then existing system of manufacture. The new law changed outdoor work to shop work. A rapid increase in the number of tubercular cases resulted. Dr. Ransom reported seventy-five per cent. of his deaths in 1890 to be due to tuberculosis, and he then earnestly but ineffectually called the attention of the prison department to the necessity of isolation and special treatment of the consumptive prisoners. At

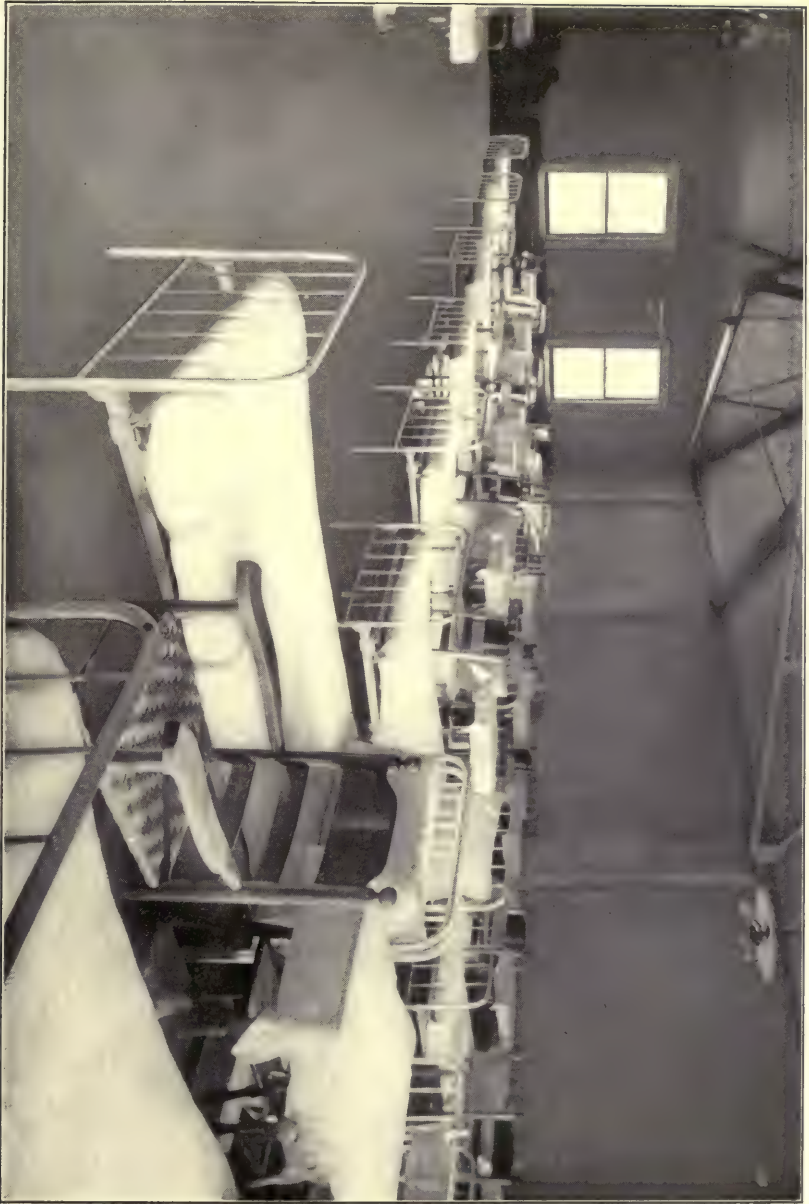


FIG. 98.—Ward for consumptives, Clinton Prison

this time, indeed, the disease was little understood. Many opposed the methods of treatment now deemed essential. The disease spread; conditions were even worse in Sing Sing and Auburn, the two other prisons of the State. Dr. Ransom had for years been urging the transfer of tubercular cases to Clinton Prison, because of its excellent location, and its isolation from the non-criminal populations. Some advanced cases were transferred, with excellent results. Continued agitation bore fruit. There came a change in the system of manufacture; improved methods of administration, especially in the medical departments; a more systematic transfer system. Then a special line of treatment was adopted. This resulted in a reduction of the consumption death-rate in the five years ending in 1901, so that there were seventy-two deaths in the three State prisons as against two hundred and fifty-three during the previous five years,—a gain of seventy-one per cent. In 1901 the Legislature had constructed a new ward for the treatment of the tuberculous. (It cost \$2500,—noble and magnanimous Legislature!) In this ward, which was attached to the prison building, were suitable accommodations for advanced cases and those positively requiring ward treatment to the number of forty-three. Here, it was found, all classes of criminals, without regard to the nature of their crimes or the lengths of their sentences, could be treated without jeopardizing prison discipline. There were no insurrections; no breaks for liberty; less trouble than “from the same number of men of the same class locked in the regular isolation cells.” Cases are now regularly transferred to Clinton from all the penal institutions, including reformatories, in the State. The consumptive prisoner is, to begin with, stripped, bathed, and given careful physical examination. His sputum is examined. If his disease is in the active stage, or if he be weak and exhausted, he is at once admitted to the hospital ward, where his condition is daily recorded. He is instructed concerning the hospital regulations, his personal habits, his sputum, his teeth, hair, and clothing. His deportment must be orderly. He may exercise in his bed aisle, and may at certain hours mingle with other members of his section, and play checkers, dominoes, etc. Other patients may go through morning and afternoon exercises, appropriate to their condition, in an outdoor court, which is provided with running spring water, benches, elevated cuspidors, a water-closet, and a crematory for sputa. Besides medical treatment a nutritious diet is prescribed, made up of cereals, vegetables, milk, meat, and eggs.

A drawback to the work is that under prison conditions tubercular patients cannot get all the open-air treatment they require. Never-

theless "it is gratifying and sometimes astonishing to see how these men improve."

The total medical appropriation made for Clinton Prison is \$4000, a small sum indeed. All the work done for these consumptives, in addition to the general prison work, has been done by the same medical staff as is provided for the other prisons,—a resident physician, a pharmacist, and a trained nurse, the latter at a salary of \$50 a month. Of course, these conditions cannot continue and must be changed, as may be seen by comparing this staff with that of other institutions for the tuberculous. The sanatorium at Fort Stanton has four medical officers, two pharmacists, and forty-one attendants. That at Rutland has two visiting physicians, four residents, one dietician and steward, and one superintendent of nurses.

New York State thus leads the way in the establishment of a tuberculosis ward in its prison hospital service. Nevertheless it has but begun its work. It has probably a larger number of consumptives in its penal institutions than have other States, because of the conditions existing in New York City, the largest feeder of its prisons. Besides, its prison construction is generally almost mediæval in character, in which respect it compares unfavorably with other States. It still maintains the altogether unsanitary bucket and whitewash system, the dust of the latter predisposing greatly to tuberculosis.

The condition of the average jail is responsible for the development of a large percentage of cases that were well before incarceration. Nearly all essentials for the prevention of infection are neglected. Prison methods have not resulted in the early detection of tuberculosis; milder types have gone unsuspected; latent or inactive cases, or such as are not easily recognized, have been subjected to conditions favoring the development of the disease.

Dr. Ransom recommends, with regard to Clinton Prison, instead of the present makeshift, the construction of a special and adequately commodious hospital apart from the prison building. New York State has now some seven hundred consumptive convicts; the last appropriation made provides in all one hundred and fifty-four beds with which to meet every demand. Dr. Ransom would have all buildings connected with penal institutions especially constructed with a view to proper sanitation. They should be so placed as to admit morning and afternoon light, with high ceilings, large windows and an adequate ventilating system. The cells should be large, well-lighted, and provided with water-closet and wash-basin; they should be constructed of steel, and a washable paint should be used as an interior finish,—no whitewash anywhere.

The law should require the physician of every juvenile or other penal institution to examine each new-comer for possible tuberculosis; and data should be recorded upon blanks provided for that purpose. If the prisoner be a consumptive, the physician should at once fill out such a blank and file a copy with the District Attorney. The trial may thus be hastened, as also incarceration (if there be conviction), so that the prisoner may at once be benefited by the special provisions made in his behalf. Up to the time of trial he should be isolated. If he be acquitted, he should be told of his condition on his release. All cases found in penitentiaries and the like should be isolated and transferred on the detection of the disease. Those in a condition requiring it should have outdoor work. They could, for instance, raise vegetables for the use of the prison, as has been done at Clinton with excellent results. There should be open wards for such prisoners. A cell seven and one-half by seven and one-quarter feet, with a bucket for a water-closet, is not a proper place for a consumptive. It is in the cells that much infection takes place. Dr. Ransom cites specifically the case of a young inmate upon whom he operated for a wound. Soon after, he became sick and exhibited general symptoms of acute tuberculosis. The cause of the infection was obscure until the cell history was looked up. Its former inmate was a consumptive. The cell had been thoroughly cleansed and whitewashed,—an ineffective safeguard, however.

The example of New York State has been followed in Connecticut, Indiana, Kentucky, Minnesota, and South Carolina. Texas has since 1899 maintained for tuberculous convicts the Wynne Farm at Huntsville, a high and well-drained region. All the prisons of the State transfer their tuberculous inmates, no matter in what stage, to this farm, which is supervised by the Superintendent of Penitentiaries. The strictest hygiene prevails. The men are nearly all worked at some light form of gardening, farming, poultry- or stock-raising. One hundred and eighty cases—whites, negroes, and Mexicans—have, during the first three years, been treated under these circumstances. Forty-six died (24.44 per cent.). Before this system was inaugurated about half the deaths in the State prisons were due to tuberculosis. This report emphasizes the feasibility of transferring all consumptive convicts to a central place for treatment, the benefits to be derived in the way of reduction of the number of such convicts in the various prisons of the State, and the practicability of light outdoor work for these cases. This farm is expected soon to be self-sustaining, apart from the expense of guarding the men.

CHAPTER VI

THE FINANCING OF THE TUBERCULOSIS SITUATION

The struggle with tuberculosis is intimately bound up with the solution of the most complex economic problems, and no plans will be complete which have not for their basis the material and moral improvement of the people. The struggle with tuberculosis demands the mobilization of all social forces, public and private, official and voluntary.—CASIMIR-PERIER.

THE whole problem of financing the tuberculosis situation is one of greatest difficulty. There are many considerations,—the cost of land and buildings; the expense of maintaining them; the ability of consumptives to pay wholly, or at least in part, for their treatment and other things essential to their cure; the perplexing question of the charitable care of those who cannot, involving always the possibility that an unfortunate tendency to pauperism may be engendered, so that while perhaps the bodies of such patients are being made well, their characters are being undermined; the question how the dependents of the consumptive wage-earner are to be taken care of while he is from work; the extent to which private individuals or associations may be asked to contribute to the support of poor consumptives; the extent to which municipal, State, and federal authorities should act in this regard,—these and many other elements must be taken into account; and in considering expense with regard to prevention and cure one must make comparative estimate of the losses which would result to the State and the community if no steps were taken to mitigate the tuberculosis situation.

Expense items are set forth in other chapters and in appendices. I can but detail here Mr. Folks's estimates concerning sanatoria and their adjuncts for the poor of New York City. Four hundred and fifty thousand dollars would be required for a satisfactory institution to accommodate five hundred patients. The cost of maintenance in various institutions is as follows: The average yearly per capita cost of patients at Saranac Lake is nearly \$500. At Rutland the average daily expense is \$1.42 per capita. The average number of patients at this rating has been one hundred and seventy-seven. The per capita expense would no doubt be much less than this for five hundred patients, as supplies could be bought more advantageously in larger quantities. At the Bedford Sanatorium, with an average of

one hundred and thirty-four patients, the per diem cost has been 76 cents. The raising of produce on the farm assists in reducing the cost. The Loomis Sanatorium, at Liberty, reports a per capita cost at the Annex, which is on the ward plan, of \$1.21 per day. This is based on the care of thirty patients; a larger number would no doubt reduce the per capita cost. The St. Joseph's Hospital, with an average of three hundred and forty-five patients, reports a per capita daily cost of 80 cents. The Seton Hospital, with an average of one hundred and ninety-five patients, requires a per capita cost of 79 cents. The Metropolitan Hospital, on Blackwell's Island, with an average of six hundred and twenty-three patients, requires a per capita daily cost of 74 cents. For the institution contemplated for New York City Mr. Folks would estimate a per diem cost of \$1 for five hundred patients, or a total for the year of \$182,500,—an amount which might be reduced if sufficient land were provided to permit the carrying on of dairying, poultry-, vegetable-, and fruit-raising on a large scale. This cost of maintenance includes food (which must be abundant and good), clothing, bedding, salaries, medical supplies, light and fuel, and ordinary repairs.

The Ohio State Commission would build sanatoria in various regions within that State. To begin with, \$200,000 should be appropriated for a site and the erection of properly equipped buildings. The average stay of patients would be six months; so that the institution should be capable of caring for one hundred and fifty patients daily, and three hundred a year. By the addition of tents many more could be taken care of. It is recommended that no patient shall be accepted under fifteen or over forty, nor any but incipient cases; that a tract of some hundred to two hundred acres be secured, much of which should be suitable for agriculture.

Dr. Holmes very aptly compares the struggle of a tuberculous patient to a nation defending its life or its honor. Similar questions are presented for solution, and identical conditions are to be met. War between nations and war against disease are often declared with little warning. In either event the defenses are frequently found in a weak condition, the finances at low ebb, and the strongholds in a neglected state. The nation that fails to prepare for war in time of peace can make but a feeble resistance when danger is threatened. An army sent to the front is certain of defeat unless plans for furnishing supplies have been carefully formulated. Disaster results if the line of communication is broken and the supplies cut off. Such a catastrophe means an indefinite siege, with indescribable privation and suffering. On the other hand, the equipment and supplies may be

inexhaustible, and yet if the commanding officer lacks judgment he may lead his brave men into dangers that mean inevitable defeat.

The great army of tuberculous patients furnish memorable object lessons. Many a patient for a time makes a good fight; yet for lack of conservative judgment or on account of overconfidence, what seemed to be a certain victory is turned into a sudden defeat. In warfare against disease the campaign should be well studied before rushing to meet the enemy. The course pursued should depend on the resources at hand. Good judgment and cunning stratagem are essential. Before a campaign is undertaken an attempt should be made to estimate the approximate cost; every effort should be made to procure the necessary funds; the field for operation should be selected with a view of securing the most favorable conditions and the strongest defenses; the source and nature of the supplies should be well considered, and a commander chosen to direct the forces whose experience and judgment are above reproach. "When these precautions are not taken defeat is inevitable. How many tuberculous patients plan a campaign with skill and judgment? Too frequently they leave all judgment at home. They take with them a good supply of bravery, but few or no other supplies; they frequently choose a battlefield with no natural defenses, and are often unskilled in proper methods of utilizing their available defenses."

With regard to the part which life insurance companies might take in the financing of the tuberculosis situation, we must not lose sight of the fact that these are essentially business and not philanthropic institutions. Any action which they would take would rightly enough be upon grounds of self-interest. We note that the Prudential Life Insurance Company of America alone loses ten thousand policy holders yearly from consumption, involving a loss of \$110,000, or \$110 per capita. Mr. F. K. Hoffman, the actuary of this company, declares that the financial interest of his company in the tuberculosis problem amounts to four-fifths of a million dollars per annum; yet he answers with a decided negative the question whether industrial insurance companies should contribute to the erection and maintenance of sanatoria. "Once the companies were to engage in this form of direct assistance to afflicted policy holders, they would soon be confronted with numerous propositions to make equal provision and grant equal consideration to policy holders suffering from other diseases," etc. He states, furthermore, that such a company represents the interests of all the policy holders, and not of any special class, however unfortunate or afflicted, and rightly observes that life insurance companies have no funds available for charitable

purposes. As it is, his company receives from each policy holder dying from consumption an average amount of \$24, and it must pay at every such death an average of \$134. German insurance companies, as we shall see, have taken up the work of sanatorium treatment of their consumptive policy holders. Within two years (1897-8) these companies had spent more than one million dollars for the establishment and maintenance of sanatoria for consumptives previously insured by them. But Mr. Hoffman points out that these companies are branches of the government insurance system, and are not private companies. Under the German system *every workman must be insured*.

The next chapter is devoted to the splendid way in which the German people have faced the problem of financing the tuberculosis situation. I would here set forth Hillier's opinions, based upon this system, concerning the same problem in England. He emphasizes two points: that the consumptive himself is to be provided for; and some provision must also be made, while he is incapacitated, for those dependent upon him. As regards the latter point there is bound to be impoverishment sooner or later, whether the consumptive be taken early from his work or left a year or two longer until work or cure are impossible. Evidently the prospect of eventually restoring his wage-earning capacity should more than compensate for the temporary money loss entailed by his early removal. It is indeed "only the hand-to-mouth way that the public have got into of regarding every question in relation to the working classes, which has led to an economic fallacy about the ruthlessness of removing the consumptive wage earner from his work."

In England the principle of subsidy through the poor rates, friendly societies, and private charity, largely predominates over the more rational and business-like German methods. Can the German method be transplanted to England and to other countries? Is the consumptive to continue "to be sent home on a sick allowance and a weekly bottle of medicine from some dispensary, to spit on the hearth and cough his time away amid the family, doomed himself and probably infecting others?" To counsel compulsory insurance among the Anglo-Saxon races is probably too Utopian for practical consideration at present. Funds must continue to be looked for from friendly societies, corporations, boards of guardians, county councils, and private philanthropy. Even in Germany sanatoria are by no means entirely provided for by the State Sick Insurance Department; they are contributed to from many other sources, of which private contributions are by no means the least. Indeed, "what is required is to bring to

bear upon the extinction of the diseases due to tuberculosis all the agencies which we can command.”¹

How may money be had to fight tuberculosis irrespective of State appropriations? Flick declares there are men and women everywhere who are willing to do much for charity and philanthropy, “provided it is clear to them that the money which they give is judiciously expended and yields fruit in practical results. If the right effort is made, the money which is necessary can be raised.” Tuberculosis is a disease which comes home to every one at one time or another—somewhere in his family or among his friends—so that practically every member of a community will consider an appeal. There is in Canada a method of raising money for such purposes as this which might be engrafted upon our American system of State government. This is the enactment of a State law under which any community may get a certain amount of State aid, in proportion to the amount of work which the community itself does. If a community would establish a sanatorium for consumptives, it could under this system draw from the State an amount of money proportionate to that which it has itself raised; and for every patient treated it would get from the State a certain percentage of maintenance money for each day of his treatment.

¹ Sir William Broadbent, the chairman of the Council of the National Association for the Prevention of Consumption.

CHAPTER VII

STATE INSURANCE FOR WORKMEN IN GERMANY

We consider it our imperial duty to impress upon the Reichstag the necessity of furthering the welfare of the working people. We should review with increasing satisfaction the manifold successes with which the Lord has blest our reign, could we carry with us to the grave the consciousness of having given our country an additional and lasting assurance of internal peace, and the conviction that we have rendered the needy that assistance to which they are justly entitled. Our efforts in this direction are certain of the approval of all the federate Governments, and we confidently rely on the support of the Reichstag, without distinction of parties. In order to realize these views a bill for the insurance of workmen against industrial accidents will first of all be laid before you, after which a supplementary measure will be submitted providing for a general organization of industrial sick relief insurance. But likewise those who are disabled in consequence of old age or invalidity possess a well-founded claim to a more ample relief on the part of the State than they have hitherto enjoyed. To devise the fittest ways and means for making such provision, however difficult, is one of the highest obligations of every community based on the moral foundations of Christianity. A more intimate connection with the actual capabilities of the people, and a mode of turning these capabilities to account in corporate associations, under the patronage and with the aid of the State, will, we trust, develop a scheme to solve which the State alone would prove unequal.—*Message of the Emperor William I. to the Reichstag in November, 1881.*

THE German people have grappled nobly with certain economic problems related to the tuberculosis situation. These problems are vastly important of consideration, especially that one which seeks to obviate pauperism for the consumptive, and to prevent his becoming an object of charity. A system by which every laborer and servant is obliged by law to become insured against sickness, accident, and old age, the companies being controlled by the Government; a system by which in one year eighty-two thousand insured men and women were treated in sanatoria, so that seventy-one per cent. of them returned to their work "with strength and hope won back;" a system which with all these results has vouchsafed to the consumptive his self-respect, is certainly worthy of study.

Procedures have been evolved out of the imperial mandate just quoted under which the workman, incapacitated by sickness, accident, infirmity, or old age, has a legal right to a measure of provision, both for himself and family, which saves him from being compelled to rely upon public charity. The means by which this end has been attained

are based upon compulsory insurance on the part of the workman and his employer, under a system of administration in which the insured are represented. Under this system there are three forms of insurance,—accident, sickness, invalidity and old age.¹

(1) In accident insurance the premiums are paid entirely by the employer, and in case of death resulting an allowance is made to the survivors from the day of death. For widows and children this allowance is fifty per cent. of the yearly earnings; for dependent parents, twenty per cent. During the first thirteen weeks an injured man is supported out of the sick fund, presently to be described; and if by that time he is not sufficiently recovered to resume work he receives an allowance during his disablement, up to sixty per cent. of his yearly earnings, or free hospital treatment during the whole cure, besides an allowance for his family. This accident insurance is extended to working people engaged in industry or agriculture, to officials whose salaries do not exceed \$500 a year, and to small employers. The employers are united in trade associations and contribute to the insurance funds proportionally to the wages paid, or to the number of hands employed, as well as to the risks of accident in the various occupations.

(2) In insurance against sickness the workman pays two-thirds of the premium and the employer one-third. In the event of sickness the allowance is made for thirteen weeks, or the sick man receives free hospital treatment and half the sick pay for the support of the family. Similar help is provided for women in childbed for four weeks; and in case of death the funeral expenses (twenty times the daily wages) are paid. The sickness insurance is managed by local sick associations, of which there are a number of organized branches. One of the many indirect advantages of this system is that not only is the man paid, but, feeling that his family is provided for, this knowledge prevents him from leaving the hospital too soon, and he enjoys a mind at rest,—a decided essential to recovery for every form of accident or sickness.

(3) In insurance against infirmity and old age, there is a fund which is contributed to conjointly by the Empire, the employers, and the employed. The Empire contributes to each annuity the fixed amount of fifty marks (\$12.50) per annum, and pays as well the contribution of the workman himself while he is serving in the army or navy. The employer and the employee contribute equally and in proportion to the wages earned. The payment of these latter

¹ Hillier.

contributions is really made by the employer, who every week affixes stamps to the card of the insured. These stamps are issued by the Imperial Insurance Department, and in paying the wages of the employed the employers are entitled to deduct the workman's share of these contributions. The entire charges of the workman's insurance on the year's average are as follows :

	Employers marks.	Employed marks.	Empire marks.	Total marks.
Sick insurance	5.15	10.30	. . .	15.45
Accident insurance	6.08	6.08
Invalidity insurance	4.65	4.65	2.88	12.18
Total	15.88	14.95	2.88	33.71

From this it will be seen that the workman actually does not pay one-half of the whole charges. Indeed, he gets back considerably more in compensation than he contributes for his insurance. These three branches of National-State Insurance supplement one another, and form a complete organization, which goes far to relieve distress thrown upon the entire family in the case of sickness, incapacity for work, or death of the workman. The effect is more far-reaching even than this. The social status of the workman is raised to a higher plane than that attained perhaps in any other State. In place of dependence on almsgiving he claims as a right from the State that relief in case of sickness for himself and family which the State has helped him to purchase, and not left him to beg. Out of the funds of the workman's insurance, grants by way of advances are made for improving the dwellings of workmen, and for supporting improvements of public interest. "One million marks are expended daily in Germany from this branch of provision for workmen alone, whilst the accumulated funds already exceed one milliard marks (\$250,000,000), one hundred million marks of which have been spent in constructing workmen's dwellings and special establishments for sick, injured, invalided, and convalescent working people, public baths, and similar institutions, for the benefit of the working classes. As, however, the circumstances which tend to disturb the good relations between employees and employed are everywhere much the same, the hope is natural and well justified that the consideration and forethought which the German laborers owe to the beneficent sacrifice of their employers will find an echo in other civilized countries for the welfare

of the human race and the consolidation of social peace and concord."¹ The workmen's insurance has also done much to improve the general conditions of life for the workman and his people; and the consideration that in case of sickness and incapacity for work he is entitled to an indemnity from the insurance funds, largely allays anxiety. The policy on the part of the controllers of the fund is to prevent danger from sickness and accident, and this policy, which has inspired much of the work of the State Sick Insurance Department, is described by a short formula constantly quoted, "The prevention of invalidity."

As sickness immediately makes a call upon the common fund, the various local branches or sick clubs not only address themselves to restoring the sick to health, but endeavor to prevent by every hygienic and other beneficent measure the occurrence of disease. Thus, by the aid of the State Sick Insurance Department, millions of publications, such as the "Tuberkulose Merkblatt," have been distributed among the working classes and to the officials of the sick clubs and unions, and have attracted much interest.

The three unions engaged, under the patronage of the Empress, in fighting consumption—the German Central Committee for the Establishment of Cure Dwelling-homes for Consumptives, the Berlin-Brandenburg Union for the same purpose, and the People's Cure Dwelling-Home Union of the Red Cross—have provided sanatoria for consumptives. The catalogue of the St. Louis exhibits of the German Imperial Board of Health stated that in 1904 there existed in the Empire more than ninety lung sanatoria, with altogether eight thousand beds, of which two thousand five hundred were for women patients. On an average of four patients for each bed, about thirty-two thousand patients have thus enjoyed the benefits of the sanatoria in a year. The expense of building and furnishing these sanatoria amounted, according to a moderate estimate, to more than 40,000,000 marks (nearly \$10,000,000). The building of new sanatoria was being planned, and some of these were to be opened for patients within the year. As a basis for building expenses, the sum of 5000 marks for every bed is calculated.

The Imperial Insurance Department has advised the insurance institutions to "avail themselves of the favorable opportunities offered by the exertions of these unions, and in cases of consumption, where the insured is capable of recovery, to demand the aid of the sick clubs and communities concerned, for the preservation of the work-

¹ Zacher.

man's self-support, by granting a treatment for that purpose in sanatoria which will, if the result answers the hoped-for expectations, lessen the annuities they are charged with." The favorable experiences up to the year 1899 led to an extensive support of the endeavors of the insurance institutions. It was felt that here was a question not only of guarding the family from immediate distress, but also of effecting a timely removal of members of the family who might infect the others. These efforts, together with the improvement in the general condition of the working classes, brought about by the whole organization of the State Sick Insurance Department, have already brought the tubercular death-rate in Prussia from 31 per 10,000 in 1886 to 19 per 10,000 in 1901.

One lesson which the experience of the State Sick Insurance Department has taught above all others is the necessity for sending consumptives to sanatoria at the very earliest stages of the disease, if the best curative and economic results are to be obtained. In addition to sanatoria for consumptives, and home dwellings, many other institutions for the benefit of the working classes have been promoted by the Workmen's Insurance Department. Accident stations, centres for sick nurses, and institutions for convalescents have all been erected. Loans at a low rate of interest are granted for the purpose of making railroads; for the encouragement of cattle-raising; for laborers' colonies, public baths, improvements, etc. Meanwhile the vitality of the workmen is improving, and the birth-rate among them is the highest in Europe. Moreover, the tendency to save has been increased by the compulsory insurance system. The working people have their representatives on the boards of the sick clubs and insurance institutions, who sit and vote side by side with the employers and the officials of the Empire. And "the results will in the future be still more effectual when these plans have stood in force through several generations, and have become the flesh and blood of the population."¹

¹ Herr Klein, an Imperial Councillor. Bielefeldt's paper is invaluable.

Part XII

ADMINISTRATIVE MEASURES

The great work of sanitary reform has been, perhaps, the noblest legislative achievement of our age, and, if measured by the suffering it has diminished, has probably done far more for the real happiness of mankind than all the many questions that make and unmake ministries.

LECKY



CHAPTER I

LAISSEZ-FAIRE—PATERNALISM

I often think it comical
How Nature always does contrive
That every boy and every girl
That's born into the world alive
Is either a little Liberal
Or else a little Conservative.

IOLANTHE.

MODERATISTS are few and far between. The extremes of the pendulum characterize the temperaments of most men. On the one hand, there are those who are for having everything regulated by the Government. And certainly there are many things which would be better conducted that way. However, there are ultra-paternalists who do now, and certainly will, occasion much damage if the measures they have brought to pass or which they advocate become permanent. For instance, the abolition of the army canteen has unquestionably worked woe, brought about as it was by the W. C. T. U. in the interests of drunkenness and vice. Then there is the scheme to discourage "race suicide" by means of the gratuitous distribution of perambulators. And the proposition recently advanced to furnish breakfasts to school children must upon sober reflection impress both the political economist and the judicious humanitarian as being about as vicious a proceeding as can be conceived. It has been well observed with regard to such extremists, "What a good world this would be were it not for its virtuous people."

On the other hand, there are the *laissez-faire-ists*—those comfortable folk who discern in the trend of things eternal not perspiration, but potentiality; it is they who wonder why the universe needs so much managing, why the Almighty needs so constantly to be advised. Yet, upon momentous occasions, as when woman's honor is destroyed by cadetism, and is dispensed by the check system, these *laissez-faire-ists* will jump out of their easy chairs and strike in a way to amaze their opposites. All this is by way of noting that the measures which will be set forth in these chapters are, I think, temperate and judicious; for they have been formulated by reasonable men who have learned experience through many years' work in the field surveyed.

CHAPTER II

THE HEALTH DEPARTMENT OF NEW YORK CITY

It is the province of the Legislature to procure the safety of the community, even if it interferes with the freedom of individual action.—HOBBS.

THE work of Dr. Hermann M. Biggs in the field of preventive medicine is of world-wide appreciation, as having manifestly resulted in the saving of many lives and the alleviation of much human suffering. The administrative measures, which have been put forth by the New York City Health Department during his able advisorship of some fifteen years past, are now gratefully adopted, so far as practicable, by many civic communities. Certain measures which he has found essential to the control of tuberculosis by municipalities are here reproduced from his writings :

1. The compulsory notification by the physician in charge, and the registration of all cases. The information here gathered is held to be confidential. And there is no official surveillance, as in the case of more acutely infectious diseases, such as diphtheria and scarlet fever. "It is assumed and stated positively that in all instances where the consumptive is under the care of a private physician, and the latter will undertake to give such instructions as are necessary to prevent the transmission of the disease to others, no further cognizance of the case will be taken by the health authorities after the registration." However, if the consumptive has the disease in an infectious stage, has no home, is without a physician, is living in a lodging-house or in a poorly furnished tenement, or is receiving charitable medical advice through some public institution, then there should be no question of the propriety of official action.

2. The sanitary authorities should afford facilities for the early diagnosis by bacteriological examination of the sputum free of cost. In many incipient cases the symptoms are not sufficiently definite to permit a positive diagnosis by the general practitioner, although the expert may easily arrive at a positive conclusion. It is essential that a diagnosis be made at the earliest possible moment. And since 1894 the New York City Health Department has provided facilities for sputum examinations, with results very valuable to physicians, to the

sick, and to the authorities. Dr. Biggs notes the curious fact that many physicians in private practice, who are unwilling or reluctant to report cases directly, without hesitation send specimens for examination with all the facts which are necessary for registration. It is only on this condition that examinations are made. There are now in New York City two hundred depots where outfits, blanks, etc., for the collection of specimens of sputum may be obtained and where the specimens may be left for the department collectors.

3. Information concerning the disease should be given to the public by printed circulars and by the public press. The sanitary authorities have important educational duties to perform.

4. Consumptives should be visited in their homes by physicians or trained nurses, who would instruct the families and patients in regard to necessary precautions. The nurse should gather information concerning the sick person, the social condition and financial income of the family, the number of persons in it and their wages; "the number of cases of tuberculosis which have occurred, the probable source of infection in the individual, the sanitary condition of the premises, the amount of air-space for each person, the character of the light and ventilation, the precautions being observed, and the possible need of any further interference on the part of the authorities."

If it becomes evident for the good of the community that a patient should be removed to a hospital or a sanatorium outside of the city, the patient should, if possible, be induced by persuasion to go; but if he persistently refuses institutional care, forcible removal must be resorted to in instances where it is evident that the health of the community is jeopardized. It is to the Riverside Hospital on North Brother Island that many such cases are taken from New York City,—an excellent institution, comparatively palatial for those for whom it is intended.

5. Rooms or apartments which have been vacated by consumptives, either by death or removal, should be disinfected or renovated after trained medical inspectors have been sent to inspect them. In dirty and filthy premises, where the walls and ceilings are in bad condition, renovation should be required to be done by the owners. If essential for the purpose the apartments may be vacated, or if already vacant the occupation by others must be prohibited until the renovation has been completed. Fabrics which cannot be disinfected by formaldehyde on the premises should be removed by the authorities, subjected to steam disinfection, and returned.

Dr. Biggs sets forth a serious difficulty which arises from "the

frequent change of residence of some families containing consumptives, and as the families become constantly poorer on account of the financial loss and expense entailed by the illness, they move continually to a poorer and poorer class of tenements. It is often impossible to trace them, or to obtain information of their change of residence, so that proper disinfection of the apartments may be insured. The owners of the property may of course be required to furnish information of the removal, but there is danger lest this course may eventually entail some hardship on the poor consumptive in rendering it more difficult for him to find lodgings. This is the most troublesome problem to solve which we have found in New York. I do not feel sure that eventually notification by the owner of the removal of a consumptive will not be necessary, as the only solution of this difficulty."¹

6. There should be provision for repeated visits by trained nurses to cases in tenements when the patient cannot be removed to an institution, so that changes of residence, the manner in which the consumptive takes precautions, etc., may be learned.

7. Suitable food, especially milk and eggs, should be supplied to destitute families by the authorities or by others, such as charitable societies, which undertake supervision in such affairs. Some of these cases present very difficult economic problems. For instance: "A family consists of a mother, with moderately advanced consumption, and five small children. The father is dead. The income of the family from all sources is insufficient to maintain it properly and furnish the mother with suitable food. But the apartments are well ventilated and sufficiently commodious, they are neat and clean, and the mother makes every effort to obey every instruction and heed every suggestion. She insists on remaining with her children, and her presence is necessary to keep the family together. Undoubtedly the mother would be better off in an institution, and then, too, the children would be removed to an institution for children, and would be better protected from the danger of tubercular infection. But then the children grow up as institutional children, which is most unfortunate, and, furthermore, there is no sufficient sanitary ground for the forcible removal of the mother. Under such conditions, for the present at least, I believe the authorities should provide, or see that there is provided, such food or other assistance as is required."

¹ Other sanitarians very strongly advocate compulsory notification by the owners of houses.

If, however, the apartments are dirty and not well kept, or are small, dark, and badly ventilated, and like unfavorable conditions prevail, then the mother should be removed to an institution, if necessary by force, and the children otherwise provided for. Evidently each such case must be decided after a careful consideration of the facts; no uniform regulations can here be laid down. The authorities should, however, recognize their responsibilities to provide assistance in many cases, and should have means at their disposal for this purpose. If this assistance is dispensed by other authorities than the health authorities, it should be under the latter's direction and supervision.

8. The sanitary authorities should provide, or see that there are provided, and should supervise, three classes of institutions for consumptives:

(a) Free dispensaries, from which suitable cases should be referred either to a sanatorium or to a hospital, as seems necessary.

(b) Hospitals for the care of advanced cases. It is not necessary that all such hospitals should be directly under the control of the sanitary authorities, although the latter should exercise a general supervision. In large cities the authorities should have control of at least one well-equipped institution for such advanced cases as it may be necessary to remove forcibly and to retain in the institution against their will. Among such cases, in addition to those just considered, are those which are discharged from other institutions because they have there been found undesirable patients for various reasons. From the sanitary stand-point these are of all cases those which it is most essential should be provided with institutional care. Homeless, dependent, friendless, dissipated, and perhaps vicious, such consumptives are likely to be the most dangerous to the community. If not cared for in an institution, they are wandering from place to place, living in lodging-houses or sleeping in hallways or wherever cover can be found, careless concerning their sputum, disseminating infection wherever they visit. Such cases must at any cost be provided for by the sanitary authorities, and, if necessary, they must be removed to and detained in proper institutions. The same procedure should obtain for cases living in lodging-houses, or those who are inmates of public institutions not having facilities for their care. The experience of the New York City Health Department has shown that difficulty is rarely experienced in management of these cases if the accommodations which are provided and the food and care given are of a superior character. These measures can, of course, be taken only where the sanitary authorities have full power and control, and the

patients can be retained only in institutions over which they have direct authority.¹

(c) The sanitary authorities having to deal with the prevention and care of tuberculosis should have available proper sanatoria in favorably situated country districts for the care of early and incipient cases.

9. The sanitary authorities should issue regulations applicable to public institutions as to the care of consumptives. Such patients should not be admitted promiscuously into the wards of general hospitals. All public institutions caring for such patients should be required to provide separate rooms or wards. These regulations should apply not only to general hospitals, but also to hospitals for the insane, penal institutions, homes, asylums, and the like. Suitable regulations should be formulated in regard to cases occurring among the teachers or pupils in the public schools, as to employees in factories, workshops, and mercantile establishments, and as to occupations of a nature which are likely to disseminate the disease.

10. The sanitary authorities should enforce the prohibition of spitting in public conveyances, in public places, and upon the sidewalks. Dr. Biggs considers that here lies the keynote of the whole question of the prevention of diseases of the respiratory organs, not only tuberculosis, but pneumonia and other diseases as well; that all classes of the people should be educated to a recognition of and a belief in the fundamental importance of the proper disposal of the expectoration.

A number of additional measures of minor importance have been in operation. There is a semiannual census of cases under treatment in public institutions in New York City. It has been the custom for some three years past to communicate with the attending physician in cases which have been reported, and to inquire whether the patient is still under treatment, and if so, whether improvement has taken place or not, and whether the physician has any objection to a visit being made if the patient be not at that time under the physician's observation. If the physician replies that the patient has passed from his observation, and he has no objection, the department makes an effort to locate the patient and determine his condition.

¹The legality of this measure may be questioned. But the health board's position is no doubt sound. The advanced and uncared-for consumptive is a menace to the health of his neighbors. With regard to smallpox—an analogous disease in relation to possible effects upon the community—the Federal Supreme Court has decided that one must be vaccinated, willy-nilly, by the properly constituted authorities, and in New York City for many years past sufferers from smallpox and other infectious diseases have been lawfully removed from their homes.

Sectional maps have been prepared which show every house-lot in the borough of Manhattan on a scale sufficiently large to indicate all the cases of tuberculosis, and the deaths from that disease, which have from the beginning of this work come under the observation of the department; the topographical distribution of the disease has thus been demonstrated.¹

The department has had house-to-house inspections made in tenement districts by women physicians in the search for unreported cases of tuberculosis. Quite a large number have been found in this way, especially among the foreign population. Great care has been taken, as far as it was possible under civil service regulations, to obtain trained nurses and physicians who speak foreign languages,—French, German, Yiddish, Russian, Italian, and Polish.

Dr. Biggs discusses several questions with regard to his plan of administration, as here outlined,—

1. Is such a scheme feasible? It has been in force in New York City—the second largest in the world—some fifteen years past, and experience has conclusively demonstrated its feasibility and practicability. Since such is the case in this large city, smaller cities should have no difficulty in establishing and enforcing similar regulations.²

2. Are there serious objections to the enforcement of such measures as these? There was very great opposition to them in the beginning, so that many difficulties were for this reason occasioned. But experience has shown that the obstacles are largely imaginary; that the harmful results, which were predicted as certain to follow, have failed to materialize. Practically no serious difficulties are encountered in carrying on the work. The difficulties with regard to tuberculosis are really less serious than those encountered in connection with the acutely contagious diseases. There has come to be hearty approval by the majority of the medical profession, and acquiescence by the remainder.

3. What may be reasonably expected from the enforcement of such measures? There has been a more rapid fall in the tuberculous death-rate in New York City than in any other great city in the world, and this notwithstanding the fact that the conditions in many respects are much more unfavorable. In no other city is there such diversity of population as exists in many of the wards of the borough of Manhattan, in some places six to eight hundred—even one thousand—

¹ Fig. 37, page 147.

² The department has a record of 90 per cent. of the consumptives of the boroughs of Manhattan and the Bronx before their death, though in many instances, of course, it is only a short time before death.

people to the acre, whereas the most densely populated districts of Paris, Vienna, London, and Prague have only four hundred or less persons to the acre. And this dense population is in great measure foreign-born, old tongues and old customs being retained, so that the difficulty in reaching these people is unusual. During the last ten years there has been a decrease of forty per cent. in the death-rate in children under fifteen from pulmonary tuberculosis and tuberculous meningitis, and a decrease in the total tuberculosis death-rate between 1887 and 1902 of forty per cent.

Dr. Biggs does not intend to indicate that the whole of the reduction in the death-rate from tuberculosis in New York City has been the result of the measures directed especially against this disease, for many other factors have undoubtedly contributed to it, but he does believe that the very great and rapid fall in the tuberculous death-rate is the direct result of the application of these measures, and that the next fifteen years will see an equal reduction. If "the necessary deductions of our scientific convictions" be accepted, we must conclude that tuberculosis is of all the important infections certainly the most preventable. "I am not only prepared to accept fully the deductions from the known facts in regard to this disease as to the possibilities in its prevention, but would regard the experience of New York City as furnishing conclusive proof of the truth of this conclusion.

"This is the great urgent sanitary problem of the new century. In no other direction can such large results be achieved so certainly and at such relatively small cost. The time is not far distant when those States and municipalities which have not adopted a comprehensive plan for dealing with tuberculosis will be regarded as almost criminally negligent in their administration of sanitary affairs and inexcusably blind to their own best economic interests."

CHAPTER III

THE TENEMENT-HOUSE DEPARTMENT OF NEW YORK CITY

It is true that the rich and those in comfortable circumstances have it in their power to escape the disease, if they have the wit to do so. But how about the poor,—they who, like dumb cattle, are driven by their necessities into the very face of death? Consumption claims most of its victims from that class, and they have neither the power nor the knowledge to escape its clutches. Does not the Government owe them a duty? If consumption is contagious, it can be exterminated, or, at least, its ravages much curtailed; it consequently behooves every government to take up some other position in the matter than one of passive neutrality.—FLICK.

IN the year 1900 there was appointed a New York State Tenement-House Commission, whose investigation led to the conclusion that the excessive mortality which prevailed among the poor of the metropolis was due largely to want of fresh air and to unsanitary toilet arrangements. The presence of many unlighted and unventilated living-rooms was found to have a direct bearing on the great loss of life through pulmonary consumption and infantile disorders. Of the seventy thousand deaths occurring annually, twenty-five thousand were among children under five years of age, while eight thousand resulted from phthisis. There were forty-one thousand cases of infectious disease reported annually, of which ten per cent. terminated fatally. The prevalence of infectious disease was rightly attributed to the use of unsanitary toilets and sinks, from which infection was spread by flies and in other ways. There were nearly nine thousand uncovered toilets, located for the most part in the thickly populated wards. In the streets of these wards the practice of exposing food for sale on push-carts and street-stands has been common. The Commission therefore decided to recommend that unsanitary constructions in old tenements should be remedied. As a result a tenement-house act was passed, which led to the establishment of the Tenement-House Department in New York City. Robert W. de Forest was the first commissioner.

The work of this department is well set forth in its report, in two substantial volumes, which covers the eighteen months beginning January 1, 1902. The tenement-house act was by no means a mere extension of principles embodied in existing legislation. It was new

in spirit and purpose, and had for its object the improvement of the moral as well as the physical environment of the tenement population. It provided for the suppression of prostitution in tenements, and only the citizen familiar with municipal conditions for a decade past can know what this means. Besides, the act raised the standard of future building construction, and called for the alteration of unsanitary houses erected under former lax rules. The functions entrusted to this new department were extremely varied and extensive. They included supervision of all tenement building operations, compelling alterations in forty thousand unsanitary structures. There were, to begin with, eighty-two thousand inspections to be made. Every tenement-house in the city was to be inspected once a year, while houses in which the apartments averaged a rental below twenty-five dollars a month were to be investigated monthly.

The department was clothed with ample powers, as was essential in the interests of the health of humanity's submerged strata in this community. It can at once, and peremptorily, stop work on new buildings and vacate old ones. No new tenement can be occupied without its permit. All owners (or their responsible agents) must report their names and addresses, and certain other information, to the department's registrar. It may enter the private apartments of two-thirds of the city's population. It has a force of four hundred employees and a budget of half a million dollars.

The part of the report which describes the organization of the department and its methods of work is very interesting, if for no other reason than that the system instituted by Mr. de Forest and his colleagues makes evident the practical impossibility of blackmail by their subordinates. Such excellent workers as Lawrence Veiller, the leading expert on housing reform in the United States; Webster C. Bush, former Commissioner of Buildings in Brooklyn; Charles B. Ball, former Chief Inspector of Plumbing in the District of Columbia; Prof. Wm. R. Patterson, former Statistician of the State Board of Control of Iowa, and Miss Kate H. Claghorn, of the Federal Census, were Mr. de Forest's associates.

The work of the department has been excellent in every conceivable way. And the public has evidently been convinced of this, for subsequent attempts to emasculate the tenement-house act in the Legislature have aroused spontaneous and altogether effective protests from every honest and decent quarter.

The thousand odd photographs taken by this department reproduce the ghastly conditions in which many a wretched family was situated. And the picture showing the condition of things after the

department's activity are in the reverse degree most gratifying, as is here seen. In December, 1903, Mr. de Forest reported to Mayor Low :

“Tenement conditions in many instances have been found to be so bad as to be indescribable in print ; vile privies and privy sinks ; foul cellars full of rubbish, in many cases of garbage and decomposing fecal matter ; dilapidated and dangerous stairs ; plumbing pipes containing large holes emitting sewer gas throughout the houses ; rooms so dark that one cannot see the people in them ; cellars occupied as sleeping places ; dangerous bakeries without proper protection in case of fire ; pigs, goats, horses, and other animals kept in cellars ; dangerous old



FIG. 99.—The cellar of a macaroni factory. In the pan in the left-hand corner is a mixture of macaroni. On wet days this macaroni was dried in this cellar alongside the goats. The cellar was filled several feet high with accumulations of filth. House vacated by the Department.

fire traps without fire-escapes ; disease-breeding rags and junk stored in tenement-houses ; halls kept dark at night, endangering the lives and safety of the occupants ; buildings without adequate water supply. The list might be added to almost indefinitely.

“The cleansing of the Augean stables was a small task compared to the cleansing of New York's eighty-two thousand tenement-houses, occupied by nearly three millions of people representing every nationality and every degree in the social scale.

“The task that confronted the department was not, however, limited to this. Without organization, without employees, with all its problems before it, it was on the very day that it came into existence

confronted with an organized and vigorous attack in the Legislature upon the fundamental principles of the law for whose enforcement it was created.

“Living accommodations for sixteen thousand seven hundred and sixty-eight families, or eighty-three thousand eight hundred and forty persons, have been provided in sanitary, comfortable, and decent houses, each one of which has been built according to law; notorious evasion of and non-compliance with the laws has given place to their complete, uniform, and impartial enforcement; the evil of prostitution has been practically abolished in the tenement houses; three hundred



FIG. 100.—A hall and sink as the Department found them.



FIG. 101.—The same hall and sink as the Department left them.

and thirty-seven thousand two hundred and forty-six inspections have been made.

“The registration of forty-four thousand five hundred owners’ names has been secured, thus fixing the responsibility for bad conditions in the tenements; contagious disease has been checked and prevented; thirty-two thousand eight hundred and twenty-five citizens’ complaints have been investigated and the conditions complained of remedied. The existing tenement houses have been frequently and systematically inspected.”

We may here emphasize that this Tenement-House Department is in constant contact with property holdings of enormous value, and with a vast number of people of varied interests. Its relation with the public apparently presented opportunities for blackmail on a large

scale. And general municipal experience in this country certainly gave no assurance that, even if corruption could be avoided, this particular department would be competent to enforce effectively and impartially a law so complex as the one by which it was established. "Indeed, most of the flagrant evils which this new law sought to remove had grown up through past corruption and inefficiency in the Building, Health, and Police and Fire Departments. When, for example, the State Tenement-House Commission of 1900 made an inspection of six hundred and eight tenement-houses in process of construction under the jurisdiction of the old building department, violations of law were found in all but fifteen of the buildings."¹ Mr. de Forest and his associates recognized that in their work they would have to face adverse influences. Honest administration of the department was not sufficient; tact and ability of the highest order were also essential. If this act was to remain permanently on the statute books, the value of the work would have to be very thoroughly demonstrated. That this was done no one will question who examines their report, to which the reader must be referred for a detailed examination of the methods pursued. Suffice it to say that the work of these gentlemen has not only firmly established the cause of housing reform in New York, but has "demonstrated clearly that corruption need not exist in any of the large city departments."

The Tenement-House Act made this department an entirely new branch of the city government. Before its creation the duty of enforcing the laws with regard to cleanliness in tenement-houses rested with the Health Department, which could not, however, because of insufficient appropriations, carry on a systematic house-to-house inspection. The health authorities could but investigate citizens' complaints and keep watch upon houses in which recent cases of infection had occurred. A large proportion, therefore, of the city's tenements had fallen into a position of neglect which certainly resulted in a great waste of life among the occupants, particularly among infants. And for more than a generation the crowded, filth-polluted tenement districts have been regarded as a source of danger to the community at large because in them were lodged, and from them were spread, epidemic diseases; so that no more important function was entrusted to this new department than that of maintaining an effective sanitary inspection service. This work is threefold: all tenements are inspected at regular and frequent intervals; citizens' complaints are investigated; houses in which infectious diseases have occurred are

¹ Editorial in New York Sun, August 4, 1904.

thoroughly overhauled. In pursuance of orders issued by the department during the eighteen months covered by the report, twenty-one thousand five hundred and eighty-four repairs were made to plumbing,



FIG. 102.—Advertising sign constructed in front of the only windows of six rooms, shutting out all light and air.

thirteen thousand six hundred and seventeen water-closets were cleaned, twenty-nine thousand and ninety-six walls and ceilings were put in proper condition, and forty-five houses were vacated as unfit for habitation.

Under the present system the complainant, if a tenant, is in no danger of having his name disclosed to the landlord; so that nearly thirty-three thousand complaints were received, of which but seventeen per

cent. were found to be without foundation.

From the Health Department morning reports are obtained of the cases of infectious disease "closed" on the preceding day, such being cases where the infection is ended and the premises have been disinfected.

This Tenement-House Department has an ingenious but simple method of card filing which enables it to keep a constant lookout for houses with a high record of legal violations of infectious diseases. Thus organized, this service is a model of its kind. It has banished forever the danger of epidemics and has checked the ceaseless waste of life resulting from filth-contaminated dwellings. The city has been made clean in the obscure recesses of its buildings as well as on its thoroughfares, as is demonstrated by the fact that there has been a fall in the death-rate from 20 per 1000 in 1901 to 18.18 in 1903.

Besides the duties already enumerated this department was charged with that of keeping fire-escapes free of encumbrances. It



FIG. 103.—The same premises after the Department had acted.

was to keep a record of deaths, of sickness, and of arrests among the tenement population. Weekly statements were to be submitted to it by the police, and by all dispensaries, hospitals, and charities in the city. A special bureau was provided for this statistical work. Thus much material would be collected that would tend to disclose the influence of housing environments, as the health, the morals, and the economic welfare of the tenement population.

This tenement-house law of 1901 is the fifth which has been enacted for New York City. Four previous laws failed to accomplish a complete reform, chiefly because they were framed with reference to a lot unit of twenty-five by one hundred feet, which prevailed in Manhattan borough. The dumb-bell tenement was introduced through a prize competition in 1879, and perhaps it was as good a type of multi-family house as it was practicable to build on a site of these dimensions, where land values are high. The dumb-bell was in effect a double house, with the space between its front and rear apartments occupied by halls and water-closets. Each floor contained four apartments, two of which faced the street and had four rooms each, while two, facing the back yard, had three rooms each. Along the middle of each side of the building was an indentation of the wall about twenty-eight inches wide and fifty to sixty feet long, the purpose of which was to provide light and air to the five rooms on each floor on either side of the house which had no windows on the street or the yard. The wall of the adjoining house might, or might not, have a corresponding indentation. In either case the result was a high, narrow shaft, open at the top, but without any intake of air at the bottom. Instead of admitting fresh air and sunlight, the shaft became a stagnant, semi-dark air-well, which promoted the spread of disease and acted as a flue in case of fire.

The dumb-bell made evident the futility of hoping to build in Manhattan a sanitary and "paying" tenement on a twenty-five foot lot. The most radical innovation of the new tenement-house law was that it practically abolished this unit and made the erection of dumb-bell tenements impossible. This law introduced a wide court,

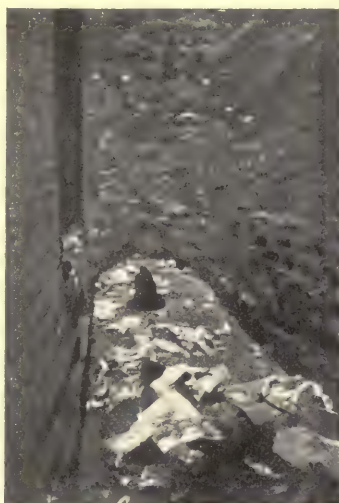


FIG. 104.—The bottom of an old-law air-shaft.

with an intake of air at the bottom, and increased the area of the yard. As originally passed it provided that a non-fireproof tenement might be carried up six stories on a plot forty or more feet in width, but only five stories on a site with a smaller frontage. However, it was soon found that a five-story house could not be made to pay on the high-priced land of the congested neighborhoods, and, at the instance of the department itself, the law was amended in 1902.

Non-fireproof tenements, six stories high, may now be constructed without reference to the size of the lots. However, the requirements with regard to light-courts and yards demand a comparatively large site in order to obtain the most economical and profitable arrangement of floor plan. The sites now preferred have a width of from twenty-seven and a half to fifty feet and a depth of one hundred feet. It is still possible to get four apartments on a floor in a twenty-five foot house, but the number of rooms has been reduced from fourteen to twelve. This size lot is used only where a larger site cannot be pieced together, and upon it but five per cent. of the tenement-houses erected during the period covered by this report were built.



FIG. 105.—A portion of the bottom of a new-law court, showing tunnel for circulation of air.

The typical new-law tenement seen in Manhattan is not only a larger house than the discarded dumb-bell, but its apartments are larger, containing five and four rooms instead of four and three. The law requires a water-closet to every apartment. As space has to be set aside for this purpose, the extra room and cost required for putting in a bath are relatively small. Consequently nine-tenths of the new houses have completely equipped private bath-rooms, removing the popular distinction which formerly existed between a flat and a tenement.

A salutary result of the activity of the commissioner and his associates is that many structural alterations have been made by owners of property without pressure from the city. The latter have learned that investors will not buy unless a search is obtained from the department showing that the tenement offered conforms to the law. Furthermore, it was early discovered that the improvements yield a handsome speculative return, because of the increase of rents

which they permit. The net profit realized in the case of a typical five-story tenement amounts to between \$2000 and \$4000. Professional enterprise and capital have consequently been enlisted in the



FIG. 106.—A living-room as the Department found it.

service of housing reform, and the remodelling of unsanitary tenements on speculation has become one of the principal features of activity in the real estate market.

This new law has in fact practically effected the abolition of the tenement-house proper, leaving two grades of multiple dwellings, the flat and the apartment house. A tenement is a multiple dwelling which has neither passenger elevator nor separate toilet and baths in each apartment. A flat has separate toilet and baths but no elevator. An apartment-house combines all these conveniences. They are all



FIG. 107.—Same room as the Department left it.

tenements in the language of this law. By it every apartment must have a toilet, and for the reason given baths have been added to the toilets; so that few houses are now erected without private baths.

The observations here set forth concerning housing conditions for the poor in New York City will be found pertinent concerning urban life generally in the United States, where the urban population is twenty-six millions, while the population outside of cities of ten thousand inhabitants and over is about fifty-four millions. And the urban population is increasing at a rate much more rapid than that of the rural. Of the total increase between 1900 and 1903 nearly one-half was in the cities.¹

Practically all the large towns in this country will have to be rebuilt during the next generation, and it were well if architects, builders, and their associates would most scrupulously consult sanitary authorities during their work.

¹ Insurance Engineering.

CHAPTER IV

ADMINISTRATIVE WORK IN OTHER MUNICIPALITIES

How should we combat bad sanitary conditions in homes?

1. By an educational health campaign in the homes, carried out by the board of health and a staff of trained visitors.
2. By a compulsory notification of cases in all cities.
3. By enlarging the powers of health boards, so as to deal efficiently with the question of disinfection of the houses occupied by tuberculous patients.
4. By attention to housing of the poor, proper control of tenements, and the regulation by law of the number of persons in each house.
5. By placing upon the landlord the responsibility of providing, under the control of the board of health, a clean, wholesome house for a new tenant.
6. By the wholesale condemnation of unsanitary streets and blocks and the rebuilding of them by the municipality.—OSLER.

THE virile and achieving personality of Dr. Lawrence F. Flick has potently impressed itself with regard to the health of another great city. This physician was in his earlier years, like many a colleague who has taken up this work, himself a consumptive. Upon his recovery he determined to relieve, in so far as in him lay, other like sufferers. After many years of conscientious labor in those parts of Philadelphia where the disease was most rife, a philanthropist of great fortune established at his instance the Henry Phipps Institute for the Study and Prevention of Tuberculosis. And this institution, with this master physician for its director, is now a tremendous factor in the alleviation of the sufferings of very many thousands. From Dr. Flick's writings I here educe certain observations concerning the tuberculosis situation in cities:

In large cities both domestic and working life differ very materially from such life in other places. Every living-place is crowded. There is little or no air-space between houses. Streets are narrow—sometimes without exit—having "blind alleys." There is much traffic. Because of many fires a vast amount of unwholesome and irritating matter is thrown into the atmosphere. Filth accumulates, the excreta—both human and animal—of many thousands must be disposed of. Much dead organic matter or worn-out inorganic matter is scattered about. In workshops there is inadequate air space. In country places there are such conditions as these, but they are all scattered over so large a territory that evil consequences are not so likely; and

in cities not only is the infectious agency more prevalent, but predispositions are much likelier to obtain.

The prevention of tuberculosis is pre-eminently a governmental function. There are many things necessary which the individual cannot do because he has transferred his rights in the premises to the government. He cannot by himself prevent another from contaminating a place which they both occupy. Neither can he compel the other to disinfect this place. And when the citizen changes his habitation he has no way of informing himself as to the sanitary condition of the house into which he purposes moving.

One of man's inalienable rights is that of personal security, of legal enjoyment of life, limb, body, health, and reputation. In the interest of peace he intrusts this right to the government under all circumstances except when he is in imminent danger. He is, therefore, with this exception, absolutely dependent upon the government for its maintenance. And, when it is infringed upon, his only remedy is to invoke the aid of the law.

But, generally speaking, the law has not yet created machinery quite adequate for the protection of the individual against disease. In many quarters disease is still looked upon as a dispensation of Providence. This is not the fault of the law, but the fault of scientific men, and of men learned in the law, who have failed to engraft upon the law the teachings of science. Of all diseases tuberculosis is the one best worked out in every detail of preventability. It, therefore, offers an excellent basis for building up legal machinery for the prevention of disease.

In general, boards of health have thus far accomplished very little because they have been badly constructed. Their measures have been unpopular because they have been inexact and arbitrary. Communities are likely to do a great deal and to give up a great deal for their own and the general good provided it is clearly defined what they are to do and what they are to give up. The public must understand what is being done.

Registration is essential. Notification should be by the householder as well as by the physician. The whereabouts of every consumptive should be known. The contamination of places and things must be prevented.

In the problem of the prevention of contamination by a municipality many factors—sociological, economical, and political—must be considered. The municipality should provide special hospitals for all dying consumptives, who would otherwise infect their environment at home. While preparations are making to this end, patients might be

maintained in the vacant beds of existing hospitals. If there are any such beds they should be in separate wards and under separate nursing, although they need not be in a separate building.

Municipalities should go into the business of treating consumptives in the curable stage. It is legitimate to do this in order to prevent the spread of the disease. To this end municipal dispensaries and sanatoria should come into being. Only in these institutions—especially the latter—can be maintained such discipline as is essential for successful treatment. This cannot be done in the homes of most consumptives. The object is the prevention of the disease, and the cure (which might be in itself too parental in character for a city to adopt) as an incidental means to an end. And the municipality is justified further in removing a tubercular subject from his home in order to prevent the spread of the disease.

How then, it is asked, is a comprehensive scheme for the prevention of tuberculosis to be introduced into municipalities? "Who shall take the initiative? The medical profession as a body quite naturally is expected to take the first step, because it knows most about the matter. The legal profession, however, likewise has a duty in the premises, and should help to construct the machinery necessary. The legislators and executive officers of a municipality, although perhaps unconscious of the fact, have a grave responsibility upon their shoulders in such a crusade against the great white plague. It is no longer possible for a man to plead ignorance of his duty in this matter and be justified, for the truth has been preached from the house-tops, and every one has had an opportunity of hearing it. Science has demonstrated that tuberculosis—the disease which claims more victims, produces more misery, destroys more happiness, creates more poverty and crime, interferes with the public weal to a greater extent than any other disease which has ever been known to man—is preventable, and has clearly outlined the methods by which it can be prevented; therefore every man and woman who has knowledge upon the subject, holds position in the learned professions or in political life, or has extraordinary wealth, owes a duty which he or she cannot evade. It will not do for any one of us to say, 'I am not my brother's keeper,' for to stand by and see our brother slain by a disease when we have it in our power to interfere is just as culpable as to stand by and see him slain by a foe in any other form."

It remains to set forth such isolated data concerning administrative control in cities as have not been emphasized. Every large city should, exclusive of the needs of the State to which it belongs, have its own sanatorium and hospital for consumptives.

Knopf considers that every city should have an efficient health department, a building department, a tenement-house commission, a street-cleaning department, and a board of education ; that all of these agencies should combine in rendering the city in as sanitary a condition as possible, in combating centres of contagion, in keeping the streets free of dust, filth, and smoke, in preventing the construction of unhealthful and unsafe dwellings, and overcrowding in homes, sweat-shops and factories, and in making the public schools well ventilated and wholesome.

Under such co-ordinate action as this, houses occupied or which have been occupied by consumptives would be registered as well as the names of the sick of this disease ; cuspidors would be directed to be placed on stairs and in the hallways of tenements, factories, workshops, and public places ; the streets would be flushed frequently, and wet always before cleansing, to mitigate the dust nuisance ; the washing of the clothing of consumptives in public laundries would be regulated ; as would also the lighting, ventilation, and height of houses, and the number of the stories, the height of ceilings, the water supply, the width of the courts, blind alleys, and the width of streets ; food-stuffs,—meats, fish, milk, and vegetables ; and the inspection of possibly infectious merchandise. The city would see to it that parks, gardens, recreation piers, open spaces in general, would be numerous. Unsanitary dwellings would be improved, or condemned and removed. Whole blocks, like the “lung block,” would be razed and supplanted by parks.

Cornet considers that “if the municipality has the right to regulate the cleansing of glasses and of the beer apparatus, the hours of business for saloons, the closet arrangement, the height of the rooms, etc., it is certainly its right, in far higher degree, as well as its duty, to regulate the disposal of the infectious material of the most wide-spread of all contagions.” Saloons should be made wholesome and sanitary. Many saloons are dreadful centres of infection. I think it would be difficult to exaggerate the importance of this procedure. It can and should be done, although for several reasons—chiefly such as obtain in local politics—the undertaking would be about as heroic a one as can be conceived. I understand that many cells in police station-houses are in exceedingly filthy condition. They should be made very clean. Not only is the “rounder” confined in these, but many an innocent man has been kept in them overnight upon preposterous charges, recognized as such by the judge on the morning following. Any citizen, rounder or otherwise, presumed as he is by the law to be innocent until his guilt is proved in court, should not

have to pass the night in a filthy and vermin-ridden cell. And it should be civic policy, at least, to acquaint the weak and the criminal, in so far as may be, with decent conditions.

In other parts of the world administrative control of tuberculosis is becoming realized. In Saxony, in Norway, and in South Australia there is compulsory notification. In Norway a law was passed for the notification of persons with tuberculous disease in a sufficiently advanced state to be disseminated with the spit or any other discharges. Every physician who has such a case for treatment is compelled to report it to the health officer of the district. "Should the health officer find that either the habits of the patient or the state of his dwelling give special ground for apprehending transmission of the disease to others, the case shall be brought before the Board of Health, in order that this body may decide on the steps to be taken. If the patient or his connections fail to act in concurrence with the orders given by the Board of Health, and it is found impossible to procure the patient nursing conducive to counteract the spread of the disease, the Board of Health is empowered to give orders for his or her removal to a hospital. Husband and wife may not be separated, however, should they express the wish to remain together."¹

Sir John Moore proposes the following excellent scheme of administrative control for homes of the peasantry and in town dwellings:

(a) (1) Compulsory notification; (2) verification of diagnosis by bacteriological examination of sputum; (3) removal of patients to hospitals; (4) periodic inspection and disinfection of the homes of the tuberculous.

(b) The provision of hospital accommodations (isolation hospitals, sanatoria, consumption wards, etc.) for (1) early cases; (2) advanced cases, to provide comfort for the dying and to secure safety for the living.

(c) The vigorous and absolute segregation of tuberculosis cases in workhouses, asylums, and other public institutions.

(d) Education of the public concerning the prevention and management of tuberculosis.

(e) Improvement of the housing of the working classes and of the very poor, especially in towns.

¹ Holmboë.

CHAPTER V

COMMUNITIES WITHOUT HEALTH BOARDS

“Public health is the foundation on which reposes the happiness of the people and the prosperity and power of the country.”

IN these communities the dispensary is essential. Here young medical men and nurses get the experience which fits them to deal scientifically with the disease. These institutions, in addition to their manifold excellencies already set forth, should be equipped to give baths, sterilize clothing, and do laundry work.¹

Where there are none, hospital accommodations should be provided forthwith. A good beginning might be made by fitting up an ordinary dwelling-house. Such buildings need not be elaborate or ornamental. They should be simply constructed and plainly equipped, and should be conducted in conjunction with dispensaries for ambulant cases. Then the medical staff of either can be used for the other.

Sanatoria should next be established for curable cases who need either comparative or absolute rest. Practically the vast majority of poor consumptives can only thus regain their health. Conditions for cure are hardly attainable in the homes of the poor. Treatment is too expensive for them. There must be good food—this costs about four dollars a week—and a comfortable, clean, uncontaminated home. To keep this so would cost at least a dollar a week. When medical attendance, medicines, nursing, and other things are added, some ten dollars a week are consumed, and this expense would be from week to week for from six months to several years.

The Reception Hospital at Saranac Lake is a purely local institution, yet its plan will interest either individuals or communities who would build small hospitals. Of course, the plan would have to be varied to fit the type of structure to be erected, be it an infirmary, a hospital, or a sanatorium. The plan of this reception hospital is excellent. It had to stand the test of competition, and the erection was superintended by very experienced pioneers in this work. It must be remembered that it was built to meet conditions peculiar to

¹ An excellent feature adopted in Cincinnati is that a physician especially qualified for such work is engaged for certain hours of the day to examine suspected cases on any physician's request. Thus many incipient cases are detected.

Saranac Lake;¹ it was for "tuberculosis patients who come with the expectation of admission to the sanatorium, but because of acute or advanced illness are refused admission and are unable to receive suitable care at a cost within their means."

There should, when practicable, be separate sanatoria for early cases and for more advanced cases. There would then be better results and cheaper administration. All early-stage cases need but comparative rest. They can do some work and can gradually acquire a capacity for doing a great deal. They will need few attendants. They can contribute something toward their own support by light farming. As all are of a class and progress rapidly toward recovery, they exercise a stimulating influence upon one another. With more advanced cases mixed in with the early cases the whole institution has to be run in accordance with the needs of the former, and consequently at much greater expense, and with the necessity for a larger medical and nursing staff, and a more elaborate domestic equipment. And "those who can work will not want to because of the example of those who cannot work." Besides, cases which are doing badly will have a depressing influence upon the others.

Communal sanatoria, which may be maintained conjointly by several contiguous counties, could be located anywhere without special regard to altitude and climate. Societies could be organized to this end, and they should interest themselves in the sanitary improvement of dwellings, workshops, schools, and offices. They should create a wholesome public sentiment.

The sterilization of houses is troublesome and costly, and so it will often not be done except under either moral or legal pressure. Where there is no health department, legal pressure cannot be brought to bear. But in most instances in small communities moral pressure will bring about the result. When the communal mind becomes sufficiently enlightened people will refuse to live in contaminated houses until they have become cleansed and until the landlord can show a clean bill of health. Disinfection of houses should be insured by the purchase of suitable apparatus,—a movable machine would be desirable, which could be used by several communities in common.

Compulsory registration, being a government function, cannot be resorted to in these communities. However, through the instrumentality of dispensaries and similar agencies, to which the consumptive will resort, it will be possible to get gradually almost a complete census of cases and of infected houses.

¹ Page 255, and Appendix F.

CHAPTER VI

STATE JURISDICTION

“The maintenance of the health of the individual is the chief requirement of the healthy growth of the State.”—*German Exhibit, St. Louis Fair.*

THE State should erect hospitals and tent colonies for its indigent consumptives, and hospitals for its tuberculous children. In some States, as in Massachusetts and New York, these things have been done; in others, movements are in progress to this end. Commissions have been appointed to investigate the subject, as in Ohio. Legislative consideration of the reports of such commissions has resulted in the making of appropriations for the purchase of suitable land, and for preliminary plans and specifications from which to erect the necessary structures. Among the States which have thus progressed are Maine, Rhode Island, New Hampshire, New Jersey, Pennsylvania, Michigan, Indiana, Illinois, and Minnesota.

As we have seen in detail, no State need go outside its limits to find a suitable situation for a sanatorium, nor for a home for advanced cases, nor for a tent farm to which its indigent consumptives may repair. Certain general climatic features are obtainable in any State.

Child labor should receive legislative attention in many States. Nothing less should be arrived at than the standard labor law framed by the National Consumers' League, which embodies the best features of the Massachusetts, the Illinois, and the New York laws. No child under fourteen may work for wages during school hours or after seven in the evening, nor may any child under sixteen work for more than eight hours a day or after seven. For the latter an educational test is required.

That it is the duty of the State to provide, at least in a measure, for its consumptive poor, is a proposition hardly questionable. In general terms it does this for its blind, its feeble-minded, its epileptic, and its insane. Surely, then, it should do so in greater measure for its consumptives, because of the greater distress and economic losses which the tuberculosis situation entails.¹

¹There are between twenty-six thousand and twenty-seven thousand insane in the thirty-nine greatly overcrowded public and private asylums of New York State. The annual increase in the number of the insane under State care is between

How should the State assume this task? The Michigan State Board of Health advises that in every municipality, and especially in townships, there should be a public health fund to be drawn upon, under proper restriction, by the health board, whenever and however the public interest demand. Such a fund could be created by the voters of every city, village, or township in a manner similar to that in which funds are provided for school purposes.

Flick puts the matter very clearly. Prevention of disease is a legislative and executive function. The former should be in the hands of legislatures and councils; the latter should be carried out by the executives of States, cities, and towns. There should be health departments independent of all other departments, and subject to the chief executive only. Every law concerning public health should be executed by this department, and nothing should be done except under the sanction of the law. All this work will have to be formulated and systematized by the joint action of scientific physicians and well-trained lawyers. Eminent men of both professions should more frequently be sent to legislative bodies. Until they are, "we probably will have to grope along with our semi-barbaric methods, with a certainty of failure, to the disgust and discontent of the people." Certain it is that the tuberculosis problem is of so great perplexity that the resources of the best of health departments will be severely taxed in the achievement of an adequate solution.

Within the province of a State department of health¹ would come the adopting of the following measures in addition to, or in reinforcement of, those already considered with regard to cities: There should be anti-spitting laws, and with these laws there should be also requirements that spittoons *must* be placed in buildings and other situations where spitting is prohibited. Unquestionably men *have* to spit sometimes, if they are not to choke, and no man should be expected to swallow his excreta. It is much worse than absurd that, as has happened in New York City, private citizens have been arrested for spitting on elevated-road stations, when the corporation owning these stations has not provided spittoons, with the contemptuous disregard of a law requiring them to do so, which has become characteristic of

seven and nine hundred, almost enough to suggest the construction of a new hospital every year. The Lunacy Commission, consisting of one medical man, one lawyer, and one layman, have the entire supervision of all these institutions, as well as the direction of the expenditure of some five million dollars yearly. (Dr. F. Peterson.)

¹ In New York a State commissionership (one man) has replaced the Health Board.

these bodies. Citizens have been arrested; but there is no record that corporations have been brought to task.

In cities, towns, and villages, except cities like New York, where regulations are enforced, there should be provision made for the free examination of the sputum of suspected cases and the free disinfection of the houses of consumptives, and inspectors and disinfectors should be engaged for such work.

Factory and workshop inspections should be very rigid. Spit-toons must be provided. Sufficient air space should be prescribed for each workingman. Printed notices should be posted in all workshops. There is no question that the State is entitled to take such steps. It has long ago assumed the right of protecting the workmen in certain callings against the dangers associated with them, and of exercising sanitary supervision in such premises; such measures as these should be extended to the protection of workmen in their workshops. Stringent laws concerning child labor should be made and enforced.

There should be legislation looking to the erection of habitable and sanitary tenements. State schools for the blind, the deaf and dumb, the epileptic and the insane, and reformatories should be inspected frequently for the detection of tuberculosis which may have developed in inmates, and such cases when found should be segregated or transferred to institutions devoted especially to this disease.

The business of milk inspection should be gone into scientifically and adequately.

The State should, after the manner of the federal authorities, take care of and provide for its consumptive employees.

The State should attend to the disinfection of railway cars, and railway companies should, if possible, be induced to provide special cars for consumptive passengers. The Kentucky State Board of Health has adopted excellent rules, to which the roads running through that State¹ have cheerfully agreed.

The State should compel a railroad to furnish a special car, with a physician and a trained nurse, for the transportation of consumptives to sanatoria and hospitals. Large numbers of these patients are carried yearly to the Adirondack region in the regular sleeping-car, with its plushes and draperies. Such a car has already been provided on one of the Western railroads. Under ordinary circumstances of travel, however, I do not consider this measure either necessary or advisable.

¹ Appendix A.

CHAPTER VII

FEDERAL JURISDICTION

Salus populi suprema est lex

WE should certainly have a national department of public health, with a cabinet secretary at its head. In lieu of this there is now the Public Health and Marine Hospital Service, of which Dr. Walter Wyman is the Surgeon-General.

In a public address Dr. Wyman has ably set forth the nature of his office. The scope of its activities is essentially inclusive of all civilization. A case of yellow fever in Santiago, for instance, or one of Asiatic cholera occurring in the Mediterranean, or one of bubonic plague in the Orient, becomes known in Washington practically within the minute of its discovery. "The nations of the earth are more nearly related than ever before in our history. All the world becomes one neighborhood, so far as relates to distances. In no manner has this been better shown than in the warfare against contagion. International congresses, conferences, and conventions are frequently bringing the nations together as one family in the struggle against these foes of mankind." Here is a common ground upon which all nations can meet,—an object worthier the expenditure of energy and money than for war and armaments. Certain it is that a nation advances from barbarism to civilization according as it eschews the latter and devotes its attention to the spiritual and physical betterment of its people, to the education of its children, to their emancipation from child labor, to the cultivation of the arts and the sciences.

Dr. Wyman's sentiments were in accord with M. Casimir-Périer to the effect that the struggle with diseases, especially of the infectious sort, is intimately bound up with the solution of the most complex economic problems. Manifestly this is conspicuously so of tuberculosis, as we have seen, so much, indeed, that this disease, which leaves its mark upon practically the whole of the race, is an index by inversion of human progress. The latter will advance in proportion as the former, with its accompaniments of poverty, wretchedness, and the insidious brutalities visited by man upon his fellows, becomes eradicated.

Dr. Wyman declares that the fundamental principles of such inter-

national congresses as he has mentioned must originate in scientific investigations and in laboratory work. "And hand in hand with science must go religion, that nations may develop conscience and a sense of justice toward one another," to the end that the dreadful infections which decimate mankind may be effectively coped with. Surely, surely. There must be religion; but it is absolutely essential, as we will presently see, that our religion shall ring true.

In order to obtain practical results along such lines as these, good laws and effective administration are required. No matter how earnest the individual citizen may be in such propaganda, however zealous in setting an example by observing precautions himself and living in accordance with scientific precepts, he cannot achieve much when conditions exist which can be remedied only by governmental power.

With regard to the Marine Hospital Service Dr. Wyman states that each State and Territory has a health department which co-operates with the Surgeon-General to the end that knowledge of hygienic principles may become widely diffused. It were well, indeed, if in this co-operative organization could be included many non-governmental institutions and associations which are maintained solely for the purpose of fighting the great white plague. In such manner could a national movement against this disease become unified and its potency increased in manifold proportion.

Dr. Wyman dwelt upon the popular diffusion of sanitary knowledge. In local politics the electorate should be taught and influenced to vote for enlightened and educated candidates; and the latter should have sufficient conscience to be uninfluenced by sordid or other mercenary considerations in dealing with questions of the health of the community. He instanced the excellent and intelligent work of labor unions with regard to public sanitation. The American Federation of Labor, with a membership of some two millions, has interested itself energetically in the tuberculosis situation; has set itself to finding out why, while parks, monuments, and all other excellent things are being constructed, less favored localities, such as tenement-house districts, should not also receive due attention. Tenements, as well as the handsomest structures, should be sanitary. The rich can abundantly provide for themselves in this regard; wherefore, the dwellings of the poor should receive first consideration. There is absolutely no reason worth discussing why there should be slums; *we should have slumless cities*. And if the health of the individual is vouchsafed, if his organism be made to meet adequately the hard facts of life, if he be made strong to work for and maintain his own, his neighborhood must

inevitably be bettered by the strength vouchsafed him. And if thus strengthened he have virility beyond these physical needs, he may develop his psychic capabilities with the result that his own happiness and that of his familiars and of his own community must inevitably be advanced.

We note that the tariff, which the essentially embryonic wisdom of our law-givers at Washington sees fit to maintain and preserve, requires a heavy tax upon "instruments and apparatus necessary for the recognition and study of tuberculosis and many other bacterial diseases, and, except recently, and for a favored few, upon books in which, and in which alone, can be found records of research upon which the means for the suppression of tuberculosis must be based."¹

The Federal Government should see to it that immigrants who are physically defective should be excluded. We debar those who have trachoma, leprosy, favus, insanity, epilepsy, idiocy, and those tainted with certain venereal diseases. With regard to tuberculosis, the matter is a much more difficult one, for there would be many incipient cases that cannot be detected, and certainly it will not, in my opinion, be humane to exclude cases of tuberculosis, unless the disease were advanced to the degree that the immigrant would become a public charge. On the other hand, it is not the part either of wisdom or of humanity to permit sufferers to further swell our tenement-house population, at present the most congested in the world, and to eke out their miserable lives in sweat-shops. Dr. McLaughlin points out that the physically defective immigrants are those who remain in the sea-board cities, while the robust penetrate to the interior of the country, where in due course of time they make homes for themselves and become merged in their communities. During the last decade those of the defective class have been increasing in population more than ever before among immigrants to this country, and this increase under these circumstances involves a serious danger to the public health of cities. In great measure this danger takes the form of tuberculous disease, which is fostered by the dense herding of ill-conditioned and underfed people. It is not selfish and inhuman, as some pseudo-philanthropists allege, to bar such manifestly defective immigrants.

The Federal Government should certainly see to it, in so far as may be, that the food sold to its people shall be pure and nutritious.

¹ "That every physician in the United States should pay a tax to the few makers of microscopes in the United States, and should be debarred from the possession of the very much better instruments which are manufactured abroad, seems almost incredible. The duty is a protective one and yields little or no revenue." (Dr. W. T. Councilman.)

The ingredients of a patent medicine should be required to be stated upon the bottle label. Whiskey and other stimulants should not be permitted to be sold until governmental tests have been made concerning wood alcohol or other poisonous material. Foods that are adulterated with paraffin or gelatin, and like materials, should not be sold under misleading names, and should have the ingredients of the things sold stated upon their labels. But it is particularly with regard to milk and meat that federal law should be stringent. For instance, the dishonest use of formaldehyde by milkmen is a constant source of danger. It has been assumed that a little of this chemical does not do much harm; however, it is unpleasant to think of using milk so treated which might be a week or ten days old.

With regard to governmental inspection of meats Cornet's investigations are authoritative. He found that in the year 1893, of six hundred and ninety-five thousand eight hundred and fifty-two adult cattle in the Prussian slaughter-houses sixty-two thousand three hundred and twelve, or eight per cent., were tuberculous. In the Berlin slaughter-house alone, from 1883 to 1892, fifty-six thousand tuberculous swine were slaughtered. "What an enormous sum of money," he complains, "passes to foreign countries in order that this deficiency in the meat supply, due to tuberculosis, may be made good, only to be replaced in great part by importation of tuberculous cattle! In 1894 one hundred and fifteen million of marks worth of cattle, deducting the exports, were imported into Germany, an amount which could be greatly lowered. Tuberculosis among cattle has become an international calamity, and its limitation a burning international question."

Part XIII

NON-GOVERNMENTAL ACTIVITIES

One God, one law, one element,
And one far-off divine event,
To which the whole creation moves.

TENNYSON



CHAPTER I

THE FAMILY PHYSICIAN

I have hope and wish that the nobler sort of physicians will advance their thoughts, and not employ their time wholly in the sordidness of cures; neither be honored for necessity only; but that they will become coadjutors and instruments of the divine omnipotence and clemency in prolonging and renewing the life of man.—BACON.

UPON the general practitioner, that man who still survives despite the specialistic tendencies of modern medicine, must fall the brunt of the fight against tuberculosis. Most cases will come to him first for advice and treatment; and generally at a time when they are curable if their condition be recognized. Wherefore, every family physician in existence should, in addition to his general training, be a specialist in the treatment of consumption. If he do not feel proficient, he should take up some dispensary or post-graduate course in the diagnosis and treatment of this disease. For it is by far the most frequent he comes upon. In few others will good and timely action bear so much beneficent fruit and so much gratitude from the patient and the patient's friends. In no other case will the mournful results following upon lack of diagnostic skill and conscienceless neglect be visited so disastrously upon him. The family physician must be very skilled in the symptomatology and diagnosis of consumption, so that no valuable time may be lost in instituting proper treatment. He will find that to arrive at correct conclusions is no easy matter. Usually by the time the bacillus has appeared in the sputum, or physical signs are distinctly manifest, the case has passed the incipient stage. He must reach conclusions from a judgment of many factors. One among these would mean nothing; several of them taken together would be suggestive; a number of them combined would be conclusive.

Having established his diagnosis, having told the patient what his disease is, he will then institute treatment upon the broad lines here laid down. He will visit the home of the patient, and explain rules for the guidance not only of the sick man, but also of all his family and of those with whom he comes in contact. He will instruct the nurse, either lay or professional, with regard to the bedroom of the patient, the wholesome cooking of his meals, the ordering of his daily

life. The carpenter may have to be called in to construct a comfortable veranda, or perhaps a roof-garden, upon which the patient shall pass most of his day. A tent may have to be constructed in the back yard or on the lawn.

The convalescent from consumption must be watched unceasingly and repeatedly instructed; reinfection is always possible. Another environment should be sought, and another occupation if the former one have been one in which consumption is easily contracted. Such personal habits and baneful manner of life as tend to the disease must be changed. For many months after the disappearance of objective symptoms must this scrutiny be continued. The bodily nutrition and strength and a right proportion in weight must be established and maintained.¹

The family physician should ponder carefully before sending a patient any great distance from home. He should have certain knowledge of the region and the sanatorium or other institution to which he would have a patient go. There is a directory which will give him certain information to this end. He should bar medical hotels and unguaranteed boarding-houses for such patients. He must be certain that there will be a competent colleague to whom he may refer his patient in the locality where the latter is to live. Treatment by letter is unreliable; such treatment exclusively is altogether unscientific, unwise, and unjustifiable.

The general practitioner must be a public-spirited man. He must interest himself in the communal prevention of tuberculosis in ways

¹TABLE OF HEIGHTS, WEIGHTS, AND CHEST MEASUREMENTS IN THE NORMAL.

Height.	Chest.		Twenty per cent. under weight.	Forty-five per cent. over weight
	Inches.	Pounds.	Pounds.	Pounds.
5 feet	33½	115	92	167
5 " 1 inch	34	120	96	164
5 " 2 inches	35	125	100	181½
5 " 3 "	36	130	104	188½
5 " 4 "	36½	135	108	195
5 " 5 "	37	140	112	203
5 " 6 "	37½	143	114	207
5 " 7 "	38	145	116	210
5 " 8 "	38½	148	119½	215
5 " 9 "	39	155	124	224½
5 " 10 "	39½	160	128	232
5 " 11 "	40½	165	132	239
6 " 0 "	41	170	136	246
6 " 1 "	41½	175	140	254

here set forth. He may be misunderstood,—undoubtedly he will be; but he will continue indifferent. On the one hand, he will be accused of “drumming up trade” for himself, when, if the public would but think, it would be plain that the more a physician advises preventive measures against a dangerous disease the less income he is likely to have. On the other hand, if the practitioner does not concern himself with the communal danger from an infection, the man who sounds the warning note, and all the rest of them, will want to know, “in no uncertain tones,” why the sordid doctor, concerned only with his own selfish ends, pays no attention to the public needs.

Emphatically, the family physician must notify his cases of consumption and get them registered. If his health board be of the sort which exists in New York City, his cases will not be interfered with, nor need either he or his patients be even embarrassed in the slightest degree. If the case have no private physician, if it be a “hospital or a dispensary case,” the patient should be glad of the ministrations which the health board can enlist, and he should not begrudge the safeguarding of the communal health with reference to his illness. Any other consideration than this is not humanitarian; it is in reality only blind, stupid brutality. A physician who will not subscribe to a course so plainly rational and beneficent should never have taken the Hippocratic oath. In any event, he has not sufficient intelligence for the practice of medicine. Every medical man should co-operate with and hold up the hands of his health board. But is his health board corrupt and inefficient? Is it unworthy of professional confidence? Is it impotent because of the “pull” enjoyed by some rum-shop boss, or his sleek congener who has “vested interests” which must not be disturbed? Then, in God’s name, let him combine (combine is the word) with his colleagues, and see to it that at least one feature of American municipal government shall not be corrupt.

And while he is looking after the interests of others let him attend a little to his own. In England the physician who is required to notify his cases for registration is paid a small fee,—two or three shillings for each living case he reports. Why not? In Maryland one dollar and a half is paid the physician as a proper remuneration for the measures of prophylaxis which he exercises in each case. Other than this, nowhere else in America, so far as I know, is the physician paid for such services. Why shouldn’t he be paid for them in every community? Is not the laborer worthy of his hire?

CHAPTER II

EDUCATIONAL

Here in your great country, in which there is so much initiative, here ought to be born a great movement for the practical application to normal daily life of all the scientific truths which we now possess for training the organism to struggle against tuberculosis.—MARAGLIANO.

NEXT to the influence which the family physician must exert, that of education is most potent. And here the lay press is an indispensable factor. An astute physician has observed that the layman is likely to throw circulars of information (he gets so many of them in every mail) into the waste-basket unread and unappreciated; while if he comes upon the same matter in the columns of a daily newspaper he will assimilate it with due respect. And this observation applies also to magazines, almanacs, and like literature. Generally speaking, the information contained in good newspapers is, in my opinion, safe and sane. Evidently pains is taken to have data verified by men best posted upon this subject; and the press at all times, I believe, puts its columns of reading matter at the service of the antituberculosis propaganda. It is therefore the greatest pity imaginable that many journals, including those professed to be of a religious sort, contract to print advertisements manifestly of baneful and often of fatal effect upon the wretched consumptive. Among these many advertisements a specimen is that of "Kochine," a bogus concoction, in which the name of the great scientist is wrongfully and perniciously manipulated. Many of the "alcohol-free" remedies mentioned in Appendix B are such as are recommended by politicians and clergymen. Certainly of all conditions the most pitiable is that of the consumptive who responds to such meretricious advice. In view of the fact that alcoholism is a most potent predisposition to consumption, such advertisements as the following should certainly never appear, no matter how large the check paid for its appearance, or how needy the journal which accepts it: Duffy's Malt Whiskey. (An endorsing clergyman's picture.) "Cures coughs, colds, most forms of grippe, consumption, bronchitis, pneumonia, catarrhs, dyspepsia, and all kinds of stomach troubles. It never fails to build up a worn-out system, to soothe the tired nerves, to bring perfect health to the whole being."

Lectures should be given to the laity on this subject. In New York City this is done, as is no doubt the case in many other communities; and school-teachers should certainly be instructed regarding an elementary knowledge of this disease in children, and the prophylaxis whenever consumption is ascertained to be in families having children. In New York City posters explaining the nature of consumption are put in the school books, to the end that possibly the parents may in this way appropriate some knowledge of the disease. Older school children should be instructed in principles of hygiene, so that physiological living will become natural to them.

And it is not enough to draw the attention once to these matters; the knowledge of them must become a practical habit among the people, who must become thoroughly accustomed to the fact that there is nothing needlessly mysterious about this disease.

The efforts already made in public education are bearing fruit, as evidenced by the large number of States which have undertaken, by means of commissions appointed, systematic investigation of tuberculosis. The work of several of these commissions we have already noted. In Vermont the importance of bringing home to the people a sense of their peril is indicated in the statement that it shall be a part of the duty of the commission to adopt and make use of means to educate the people of the State with respect to the cause and nature of tuberculosis and the means that may be taken by the people themselves for its prevention and cure, to the end that its large death-rate may be reduced to the lowest possible limit. It is, however, an instance of the shortsightedness of legislative bodies, in this State as in others, that the fringes of the great problem can only be touched because of the very small appropriation available. Here, as in other States, it has been arranged to hold public meetings in every county, at which lectures will be delivered, outlining simple precautionary measures, indicating radical treatment, and anticipating foolish prejudices,—particularly that consumption is among the active fatal “contagious” diseases.

Education is, in fact, the key-note of the whole business. The things that are to be feared are those which are not comprehended; terror almost invariably disappears in the face of knowledge. And certainly such should be the case with consumption. He who knows the dangers, the sources, and the nature of this disease need never fear it.

CHAPTER III

MODEL TENEMENTS

For my own part I cannot help thinking that the first and best of all objects of charity is the improvement of the low quarters in our great cities, which cannot fail to be seed plots of disease as well as of barbarism and misery.—GOLDWIN SMITH.

As a work of wholesome humanitarianism a recent benefaction of Mr. Henry Phipps, and the method of its use, must certainly excite the warmest admiration of all reasonable and good men. He has made a gift of one million dollars for building improved tenements in New York City. For the management of this matter an organization of excellent citizens has been formed, and the chairman of its executive committee is Mr. Robert W. de Forest, whose achievements as the first Tenement-House Commissioner of New York City have been inadequately noted in this book. Others among these citizens are Messrs. Charles S. Brown, Alfred T. White, Myles Tierney, and Dr. E. R. L. Gould, the president of the City and Suburban Homes Company, which builds model tenements,—all members of the tenement-house committee of the Charity Organization Society.

Mr. Phipps would organize a society for the purpose of building tenement-houses in New York City, preferably in Manhattan Borough. The tenements, for the building of which his gift is made, are expected to earn about four per cent. on their cost, after allowing a proper amount for maintenance and repairs. These earnings are intended to accumulate and to be used from time to time in erecting more tenements. *The rooms should not be rented at a price below the market price*, for it is not desired to discourage individual investors from building tenements on a purely business basis. Building operations might thus be checked, rents raised, and injury be worked in the end to the working people. In periods of high cost and great inflation, the work should go very slowly or be stopped; where there is great depression and lack of employment, the work of building should be active. One building should, to begin with, be finished and rented, so that its efficiency may be judged, and so that the buildings which follow may be in accord with the initial experiment. There should be all the light and air possible in these buildings; they should be fire-proof and thoroughly sanitary, with as much air-space as may be

around them in which the children can play. Undoubtedly this beneficent plan will help to furnish a standard below which no landlord, no matter how calloused, will find it profitable to build and conduct his property.

A plot has already been secured for the first building. It is intended that there shall be light in every room, proper sanitation and ventilation, steam heat, a gas range, and a toilet to every apartment. There shall be good material in construction; and here again the builder who is unscrupulous may find that it will not pay him to erect, in this city at least, houses of the "Buddensiek" type, a number of which collapsed before completion.

Mr. Phipps's first tenement is given up to two, three, and four-room apartments, with a bath-room only in the four-room suites. For the others there are tub and shower baths in the basement, one for every six families. Two other plots are to be purchased. The expected income from these three is \$40,000 a year. In three years this accumulated income will buy another building. "The accumulative power of money used in this way," states Dr. Gould, "was strikingly shown by the Franklin fund." The great Benjamin more than a century ago left \$5000 to accumulate for the benefit of ambitious artificers and craftsmen. The principal now amounts to \$411,000. It has been calculated that at 4 per cent. Mr. Phipps's fund would, in a little more than a century hence, amount to \$64,000,000.

In a valuable comment upon this work, the *Evening Post*¹ says that the trustees of Mr. Phipps's gift would make no mistake if they devoted some portion to homes for colored people. "Their plight is grievous. Only the worst buildings are open to them, for which they are charged higher rents than are asked of white people, on the ground that negro occupancy of a house causes it rapidly to deteriorate in value. Now, the negroes are great home-lovers. With all their defects, they are cleaner, as a class, than many of our foreign immigrants, and they make remarkably few appeals for public funds. Yet decent colored people are often forced into disreputable associations for lack of other quarters, and their need of good tenements is great."

In the city of Washington model tenements are being built and conducted by the Washington Sanitary Housing Company. Here again the word philanthropy rings true. This company's work is based upon principles of relief of baneful conditions. However, I am glad to note that "charity is here controlled by business princi-

¹January 14, 1905.

ples, the only sound method of its ministration.”¹ Two-story houses are built containing three- or four-room flats, with bath-room and sanitary plumbing, on sites formerly occupied by unwholesome shacks. These flats are rented to those who cannot pay the \$10 or \$16 rent of other available houses. The rents are \$7 or \$8 a month. Proper care of the houses is assured by setting aside one month’s rent each year for interior repairs. The difference between the cost of necessary repairs and this rent is given to the tenant as a rebate; hence the incentive for making the repair bill as small as possible. “The financial possibilities of the enterprise are shown by the payment of the four per cent. dividend annually, and, in addition, the accumulation of a handsome surplus. The company has borrowed money to complete a row of houses and seeks to sell additional shares to liquidate its indebtedness and still further extend its operations. No trouble should be had in selling to the citizens of Washington hundreds of shares. Subscriptions mean philanthropy, improvement of the city, and financial return. The officers and directors of the company include men of such national and international reputation as Sternberg, Foster, Kober, Pinchot, and Riggs,—sufficient guarantee of the integrity of its workings. The success, sociologic and financial, of this enterprise should be widely known. Such examples herald the time when charity will cease to cover a multitude of sins in the way of further degradation of the people it would aid.”

Goldwin Smith, both intellectual giant as he is and earnest believer in the fatherhood of God and the brotherhood of man, has, in the twilight of his beautiful and eventful life, undertaken a practical reform for the benefit of the workingmen of Toronto, his adopted city. He has purchased a block of land, upon which he will have constructed a number of homes with modern improvements and affording ample breathing space, to be leased upon moderate terms. And this measure of relief has wisely been placed upon a sound business basis.

In England the solution of the housing problem “has been largely assisted by philanthropy and private efforts, and the name of Lord Rowton will ever be honorably associated and remembered in connection with one of the most important social movements of the present generation.”² Rowton houses are large lodgings erected in various parts of London. In them are combined the advantages of co-operation on a large scale with something of the comfort of a modern club. They are clean, airy and light. The cost for each individual is only a trifle more than is paid in the cheapest city lodging-house, and the

¹ American Medicine, January 14, 1905.

² Hillier.

physical and moral gain is great ; moreover, commercially the lodging-houses are a success. They therefore have an assured future and already many cities are providing similar institutions for the poorer classes.

It may be that the discerning man of means will see in these matters of housing improvement some decidedly convincing reasons for investment of his capital in accordance with sound business principles, in such manner that he may well earn a righteous profit and be at the same time entitled to the high opinion of his fellow-men. Here he would be engaging in "philanthropy with four per cent.,"—an altogether just and wholesome sentiment. It is evident, when we consider all the factors which make it possible for tuberculosis to destroy so much human life and happiness, that the construction of decent, healthful homes is a work than which there is none more grateful for a man to be engaged in.¹

¹ Possible investors should not fail to read the Evening Post's editorial, January 14, 1905.

CHAPTER IV

INDIVIDUAL AND ASSOCIATIONAL ENTERPRISES

To combat consumption as a disease of the masses successfully requires the combined action of a wise government, well trained physicians, and an intelligent people.—KNOFF.

MUCH private and associational work is essentially allied more or less with governmental activities; in many respects the former supplements and fortifies the latter.

Great efforts are making to mitigate the appalling conditions under which many little children have to labor. To many such even the most rudimentary education is denied, while their bodies are becoming prematurely weazened and decayed, "feeble in frame, their intellect shrunk up and dry like a tree. Their children are feebler still." There is now a powerful National Child Labor Committee, with headquarters in the United Charities Building in New York City, which has opened correspondence with organizations and people interested in child-labor reform throughout this country, and is prepared to co-operate with any local movement. The National Consumers' League, having its office in the same building, by eliminating sweat-shop prices for goods, is accomplishing much to secure for poor working people comfort and decent remuneration.

The day nursery, in which the child is taken care of for a small fee while the mother does a day's work, is a feature worthy of consideration. The child is likely to be much better taken care of in the nursery, and the strength of the mother is to a large degree conserved by this means.

The United Hebrew Charities has done an extraordinary amount of work through its committee on tuberculosis, in visiting and relieving its consumptive poor, and in persuading many to make use of such hospital and sanatoria facilities as are available. This is one of the most effective of the many like institutions in this city, some of which we have described. The methods, which are typical of all such bodies, are: the placing of applicants in charge of a special agent; careful medical examination to secure correct diagnosis; instruction of consumptives by means of pamphlets, etc., and particularly by verbal guidance, concerning the disposition of sputum; the cleanliness of the person and the home; proper diet and exercise; cessation of

unhealthful occupations; removal to more sanitary neighborhoods; general obedience to the recommendations of the City Board of Health. Excellent medical treatment is secured in sanatoria when possible; sufficient necessary and wholesome food, particularly milk and eggs, is supplied; transportation to a more desirable climate is provided, whenever indicated by the medical examination; positions in country towns and outdoor work are found for applicants.

The health requirements of school children have, in the city of New York at least, received great attention. In the summer time the playgrounds and the schools are open throughout the day. In many schools the rooms are utilized for purposes of play. Swimming tanks

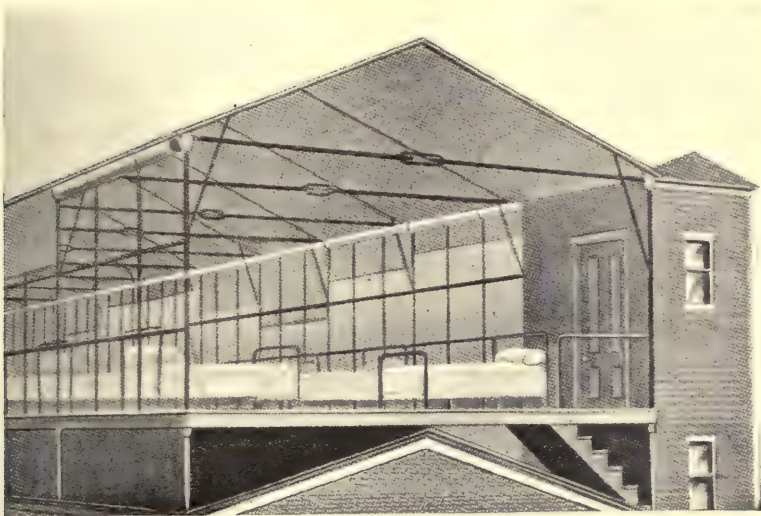


FIG. 108.—Roof-pavilion at the Rush Hospital for Consumptives, Philadelphia.

are being placed in schools, and many other features calculated to make school children vigorous and healthy are provided.

We have not yet in New York City pavilions for poor consumptives, such as have been established in Paris by M. Boucicault; but no doubt such institutions will come in time. A number of recreation piers have been established on the North and the East Rivers, where mothers and children may spend the day and the evening under very salubrious conditions. Particularly are these piers grateful in the summer season. On occasions, during very hot spells, the people have mercifully been permitted to sleep on them throughout the night.

Most house-tops in New York City are level, and many of them, in the very poor districts, are used as breathing spaces and for sleeping

on warm nights. I am surprised, however, that roof-gardens have not become a general institution. Here is a basis for the construction of a perfect solarium upon every house. Every city roof could be railed off and easily transformed into a delightful summer-night resort. Even in this regard charity has made itself felt, for the Plant, Fruit, and Flower Guild aims to put these reminders of country life upon the tenement fire-escapes and in windows and back-yards of the poor.

There are now many small parks in New York. There should be a great many more, with gymnasium appliances, swings, courts and tracks for athletic exercises. A park is being projected at the seashore, either on Coney Island or on Rockaway Beach, where the poor may enjoy the healthful advantages of sea air. Already, as we have noted, there is at Coney Island a hospital for tuberculous children.

There is in New York City an institution, no doubt duplicated in many other cities, called the Diet Kitchen Association, which saves many lives by giving nourishing food, chiefly milk, to the sick poor on the presentation of requisitions given by house and visiting physicians, by dispensary district nurses, and other workers. During the heated term this association provides modified milk for sick babies, and thus helps to reduce the high death-rate among the poor of this city. This Society, as does also the Strauss benefaction, co-operates with the Board of Health, various other charity societies, and forty other organizations in the war they are waging against consumption.

The condition of many city tenements is so unutterably bad that the saloon becomes the preferred habitat of many a miserable fellow during much of the time when he is not working or sleeping. It is an institution too deeply rooted to be removed. There is no use in getting vapid concerning it. I am of the opinion that the saloon can be made a fairly wholesome institution, as it is in many a continental city, where things are conducted in accordance with wisdom accumulated during the centuries. There is no abolishing it; it is the poor man's club. What! because others are virtuous, shall there be no more cakes and ale? Shall not the poor man, in the name of the Thousand-Souled, take his ease in his inn? I have had occasion to observe (during my sociological studies) that there are clean, tidy, decent saloons, where men drink moderately of wholesome liquor. They can all be made so, and the poor man will get no harm from such if he will take temperately of good spirits, and if he will be determined always on a "Dutch treat," and set his face against the vicious American habit of "treating round." There are many worse places than a good saloon for a poor man to be in. I write here in general terms, not concerning the consumptive. He should

not go to the saloon; alcohol in any form is not good for him. Besides, he is a source of infection in the saloon.

Labor organizations have come to play an important rôle in the fight against consumption. The United Garment Workers of America and the Central Federated Union have joined the New York Charity Organization Society in the preparation of circulars to be distributed among their members, which provide valuable information concerning the prevention and cure of consumption, and which inform sufferers where free treatment can be had, if necessary, in dispensaries and hospitals. In Chicago, labor unions have taken up the fight. Office janitors, cigar-makers, garment-workers and others are co-operating with the authorities to this end. Labor organizations, as we have seen, are contemplating the establishment of farms for their consumptive members in various parts of the country.

A School of Philanthropy was established seven years ago in connection with the Charity Organization Society, in which many social workers have been trained. Mr. John S. Kennedy has recently founded a professorial chair, which will be filled by Mr. Edward T. Devine. This chair will be allied with the Department of Economics at Columbia University. Mr. Devine, upon his appointment, expressed a weighty sentiment, which compels reflection: "The science of philanthropy is related to the social aspects of civilization in like manner as the science of medical prophylaxis is concerned with the physical life of man." No doubt the future will prove this idea to be an exceedingly potent one with regard to the tuberculosis situation.

The activities here described have developed mainly in and about the metropolis. Similar activities now characterize very many communities both in the Americas and in the Eastern world.

The National Sanatorium Association, the pioneer movement of the kind in Canada, was incorporated by a special act of the Dominion Parliament in 1896. It is a purely philanthropic organization, and every dollar which is contributed to its treasury goes to aid consumptives without means. Its trustees are selected from among its members who have contributed \$100 at one time, or who pay a subscription of \$5 or more per annum. Representation on the board of any municipality contributing to the association's work is provided for. Distinguished gentlemen, whose president is Lord Strathcona and Mount Royal, are its members. The services of these trustees are absolutely free, as are those of the association's treasurers and solicitors, and also those of the visiting and consulting physicians, who make regular professional trips to the sanatorium and the hospital conducted under its auspices, and perform many other duties con-

nected with the work. The examining physicians donate their fees to the association, for needy patients.

The primary object of the association is to establish public institutions for the treatment and cure of consumptives, and to do everything possible to check the spread of this disease in Canada through educational and legislative measures. Over thirty local associations are organized in the municipalities of Ontario. It is planned to establish, in addition to those already in existence, sanatoria at various other points throughout the Dominion of Canada, so that patients may have every advantage in the change of climate, and may be so disposed of that the highest percentage of cures may be effected. About twenty acres of land have been purchased outside of Toronto, overlooking the city. This is an ideal building site for the receiving home for consumptives, and buildings will be erected as soon as circumstances will permit. Under statute enactment every municipality in Ontario may make an agreement with this association whereby its institutions shall treat the former's patients, and such municipalities may pass by-laws or issue debentures to raise money to assist the association in this work. From all parts of Canada, "from Prince Edward's Island to Yucatan, from Herschel's Island in the Arctic Ocean," from Newfoundland, and from Canadians now residents of the United States, come manifestations both sentimental and material of the wide interest created in this work. This association has, moreover, done a tremendous educational work in the distribution of literature concerning the prevention of consumption. A travelling secretary visits the towns and cities of the Dominion, to promote additional interest in the work of the association and the cause it represents.

CHAPTER V

THE CHARITY ORGANIZATION SOCIETY OF NEW YORK CITY

We must care for the consumptive in the right place, in the right way, and at the right time until he is cured : instead of, as now, in the wrong place, in the wrong way, at the wrong time until he is dead.—PRYOR.

THIS society, both in its larger scope and because of its Committee on the Prevention of Tuberculosis, furnishes a model upon which to base other activities in this field. Mr. Devine, its very experienced secretary, points out that in no two places would the plan or work of such a society as this be quite the same.¹ A general rule would apply, however. A representative membership, not only of the medical profession but of other interests and activities, and especially of existing agencies concerned with the public health and practical philanthropy, is an initial advantage in enlisting the co-operation of all the forces in the community and the interest of all classes, and is a constant safeguard against partisan views. Local conditions must determine whether the resulting body shall be independent or under the auspices of some existing organization. Both methods have resulted well. In Chicago such an association is in affiliation with the Visiting Nurses' Association ; in St. Louis, it is a Committee of the Civic Improvement ; in New York it is as we have indicated.

On the other hand, the Boston and Scranton societies are independent bodies. Sponsorship of an organization of recognized importance in social work may be desirable, if there are no conditions imposed which might hamper the future development of the subsidiary body. On the other hand, the purpose of the new enterprise should be sufficient of itself to commend it to the public. The work to be undertaken is also determined largely by local conditions. The general features of a comprehensive campaign being agreed upon, the newly formed body should enter upon such work as had not been undertaken by any existing agency. A thorough survey should be preliminary to any plan of action. The work of other organizations should not be duplicated, though it should be whole-heartedly encouraged. In developing the campaign, older organizations may be induced to undertake such parts as are specially appropriate to them.

¹ The Directory of the Charity Organization Society.

Collateral work should be done to secure adequate and ample development of health department activities. Where there are no municipal departments, the society should try to supply the lack, preferably by having such an office established by government.

An organization of this sort will work for the development of the dispensary, the outdoor structure, the hospital and sanatorium phase of the subject, and will seek to influence to this end all sorts of enterprises both governmental and private. It should engage without limit in educational work. Indirect matters will concern it, such as movements for improved housing conditions, for better sanitation in factories, workshops, stores, and schools, for playgrounds in the city, or for the improvement of other of the multitudinous conditions such as are set forth in these pages. Upon such lines as these, considers Mr. Devine, an organization for the prevention of tuberculosis should be laid. To return to that one in New York which has proved its efficiency,—

The Committee on the Prevention of Tuberculosis, appointed by the Charity Organization Society, was organized in June of 1902. Its initial membership was sixteen representative physicians and sixteen laymen specially interested in the social aspect of the disease.

A competent secretary, a district nurse, and a statistician, who were to devote their entire time to the committees, were engaged, and the services of a large body of volunteer workers and of the expert agents and visitors of the society were enlisted. It was emphasized, to begin with, that here was not a movement *against* consumptives, nor one that would be permitted to increase their hardships. Educational work concerning the real nature of consumption was to be done to the end that popular phthisiophobia might be dispelled, as well as for the larger benefits that would result from a diffusion of correct information concerning the disease.

The objects of the committee were succinctly set forth as follows :

1. The promulgation of the doctrine that tuberculosis is a communicable, preventable, and curable disease.

2. The dissemination of knowledge concerning the means and methods to be adopted for the prevention of tuberculosis.

3. The advancement of movements to provide special hospitals, sanatoria, and dispensary facilities for consumptive adults and scrofulous and tuberculous children among the poor.

4. The initiation and encouragement of measures which tend to prevent the development of scrofula and other forms of tubercular diseases.

An appeal was made for funds, which were to be expended mainly for the following objects :

1. Research into the social, as distinct from the medical, aspect of tuberculosis: for example, into the relations between the disease and overcrowding, infected tenements, and unhealthy occupations, and also into the influence upon recovery of improved diet and hygienic living.

2. Education. The publication of leaflets and pamphlets, the giving of lectures, and the promulgation in every possible way of the fact that tuberculosis is a communicable and preventable disease; the widest distribution of the results of scientific research in this field, and of the results of modern treatment both in sanatoria and at home.

3. The encouragement of movements for suitable public and private sanatoria both for advanced and for incipient cases; for adults and for children; for free care and also for the care of those who can pay moderate fees.

4. The relief of indigent consumptives by the provision of suitable food and medicines, by the payment of rent when this is necessary to secure adequate light and air, and by transportation and maintenance at a distance, when, in the judgment of the committee, this is essential.

The labors of the committee are directed not only towards the amelioration of the condition of the large class of consumptives, but also towards the benefit of the community as a whole, in which there is encouraging reason to believe that tuberculosis may be practically eradicated. The work of the committee is not intended to be temporary merely, but its continuance and effectiveness will depend upon the public encouragement and support received.

For research and publication the committee uses much of its funds. In the relief of special cases existing agencies are asked to co-operate, but any donations which individuals are willing to make for this special purpose lessen the burden upon organizations that are already overtaxed by cases of need arising in large numbers from the class of consumptive poor.

The committee's activities have conformed with this prospectus,—how well must be judged by an examination of the Handbook which it has published. Nor will one come upon its last page without a hearty appreciation of the tremendous work which has been done and continues to be done by these humane men and women.

CHAPTER VI

THE BALTIMORE EXPOSITION

“The Truth shall make you free.”

THIS exposition was held in January, 1904. The programme stated it to be “an objective presentation to the people of Maryland of the history, distribution, varieties, causes, cost, prevention, and cure of tuberculosis.” But no one could realize how meaty was this statement had he not gone to Baltimore to enjoy the presentation. I set down here some of the exceedingly agreeable impressions of my visit. For details, I refer to the comprehensive and very interesting report of the commission under whose auspices the exposition was held.

There was a logical order to this exposition. It began with statistics taken largely (but not altogether) from the literature of the subject. The unenviable prominence of tuberculosis among causes of death, its relations to other diseases, to race, age, sex, occupation, heredity, marriage, food and drink, dwellings, wages, insurance, economic considerations,—these and many other data were set forth, generally by means of charts, in preference to exposition by dry figures. For instance, the causes of death in tuberculosis were demonstrated by means of a circle, about 150° of which represented asthenia, 10° hemorrhage, $3\frac{1}{2}^{\circ}$ pneumonia, $3\frac{1}{2}^{\circ}$ kidney complications, and 3° peritonitis. It was noted that all races are exceedingly chary about reporting cases for registration. Naegeli's now famous demonstration, that tuberculosis exists in greater or less degree in practically all of us, was graphically presented.

There was this whimsical table representing Baltimore “street-car sputistics.”

Car rides	248
Passengers	3156
Separate deposits of sputa	994
Sputa per car	4
Crowded cars	41
Counted deposits	125
Sputa per crowded car	3
Wet cars	49
Crowded sputa on wet cars	52

Sputum per car	1
Cars crowded or wet	90
Counted sputa	177
Sputa per crowded and wet car	2
Cars neither crowded nor wet	158
Separate deposits	817
Per car	5.17
Times spitting witnessed	30
Conductors seen to spit on car	2
Motormen seen to spit on car	5
Pools are counted as one deposit. Motormen are depositors of pools.	

Factory, tenement, and sweat-shop exhibits from a number of cities came next. New York City easily led this grewsome procession, and it seemed to have a banner so large as to obscure all the rest.

The exhibit of State and municipal prophylaxis was a most refreshing one, as was also the demonstration of the work done by organized charities and by volunteer associations in various parts of the country. An enormous amount of work was thus shown to have been accomplished both in this country and in Canada. The Charity Organization Society of New York made a particularly forceful showing.

In exhibits of sanatoria the State of New York, the West, our Army and Navy, Canada (especially Muskoka), England, and the continent of Europe, were all represented. There were pictures of sanatoria situated in wooded groves, upon hill-sides, upon plains, with snow-capped mountains in the distance, upon Alpine crests, so snow-surrounded that it was not easy to distinguish the building. There appeared small structures so imbedded in snow that they looked like Eskimo huts; and tidy cottages comfortably ensconced among green-wood trees. Buildings of stone and wood, of part wood and part canvas, shacks and simple tents, were shown. The German sanatoria seemed, of all, the most elaborate and the most expensive. In them are embodied the idea of having most of the plant comprised in one huge building, in contradistinction to the American cottage plan. The Weicker Sanatorium, at Goerbersdorf, most picturesquely situated in the midst of a densely wooded region; the Dettweiler institution, with its auxiliary pavilions, looked like an Arabian Nights palace; and the Brehmer Sanatorium appeared a piece of architecture magnificently conceived and much more costly, I believe, than any sanatorium which we, with our vastly preponderating resources over those of Germany, can boast of.

A very valuable feature of the exposition was the demonstration of what can be done in the way of home treatment, the plan which must, after all, be applied in most cases of the disease. If the race, indeed, is ever to "down" tuberculosis, the result must be brought about by sanitation in the individual home, the unit of our civilization. It was shown how the roof-garden, the fire-escape in the tenement, and the veranda in the country house, could be utilized in fresh-air treatment. The sun-bath system of Dr. Millet was shown. All sorts of sputum receptacles, outdoor beds and cots, protected chairs, with rests for warming-pans for the feet, variously devised outdoor coverings, food preparations, and methods of keeping milk pure, were exhibited. Neatest of all, a room was arranged by nurses to be the type of such as consumptives should occupy.

A very interesting part of the exposition was the "mural decorations," as a hospitable colleague called them. They were handsome charts, of dull red cloth, upon which were imprinted very pregnant and suggestive legends. These legends adorn many of the chapters of this book. Among them was a sentence from Hippocrates in the original. Remembering that I could once make such translations I began to reproduce this. But a sense of the melancholy brevity of human existence having come upon me, I appealed to a Baltimore colleague, who rendered it thus: "The disease which proved most dangerous and produced the greatest number of deaths was consumption." There was also one from Sophocles, which, my friend said, meant: "The gods always play with loaded dice." This did not seem quite correct, for I recalled that, although the gods were not a particularly straitlaced lot, they generally played fair. So a learned divine whom I had just met was appealed to. He assured us that the correct rendering was, "The gods always throw the cubes impartially."

The history of tuberculosis was exhaustively set forth. And the cases containing books, plates, and portraits were most delectable pasture for literary browsing, at least for the medical man. This section was arranged, I believe, by the committee on books and portraits,—Dr. Osler, Dr. D. R. Lyman, Dr. L. V. Hamman, and Dr. H. B. Jacobs.

Upon the walls were portraits of intellectual men, those who either are or have been of the University faculty,—Elliot, Schouler, Brooks, Sylvester, Newcomb, Williams, Gilman, Remsen, Adams, Rowland, and Gildersleeve. It appears to me that as one progresses southward in this country the dignity portrayed in the faces painted is tempered more and more with a kindness and urbanity of demeanor.

Over the platform of McCoy Hall, where lectures were given every evening during the week, a huge representation of the seal of the university was placed, and above this was the motto, "Veritas vos liberabit"—a most impressive motto for this University from which has gone forth so much that has made for well-being and happiness. I was greatly impressed with the largeness of the audiences. For instance, on the evening of my first hearing the lectures, when Dr. Adami spoke, the thousand odd seats and all the available standing-room were occupied. And this audience was reduplicated earlier in the week, when Dr. Flick, Dr. Ravenel, Dr. Salmon, Dr. Knopf, and others lectured. These were certainly much larger audiences in proportion, and in fact, than are likely to attend a medical discourse in our cosmopolis of three or four million people, the most of whom sadly need lecturing upon the subject of this exposition.

This tuberculosis exposition was certainly most successful, and its aftermath, no doubt, has been and surely will continue to be fruitful. Like educational enterprises have been conducted in many other communities. They should be held in every city and town in the country. The larger cities should have permanent tuberculosis exhibits. To these ends, however, there have to be masterful executives, as are Dr. John S. Fulton and Dr. Marshall L. Price, who arranged, I understand, this memorable Baltimore Exposition.

In the fall of 1905 a National Tuberculosis Exhibition will be held in New York City.

CHAPTER VII

THE NATIONAL ASSOCIATION FOR THE STUDY AND PREVENTION OF TUBERCULOSIS

Let us raise a standard to which the wise and the upright may repair, leaving the issue in the hands of God.—WASHINGTON.

On an evening during the exposition just sketched, some two-score physicians met in the "Donovan Room" of the Johns Hopkins University,—a fitting place, the walls being adorned with the portraits of great men, copies of their writings and their poems, memorials of their achievements, which were wholly and altogether beneficent. The reason of this special meeting lay in the idea to found a representative American association for the study of tuberculosis and for the prevention and cure of the disease. There were already several such organizations in this country, which, after the genial and venerable fashion of medical enterprises, were in antagonism one with another. As a result, European bodies devoted to these ends, who were anxious to put themselves in correspondence with American endeavor, were puzzled with whom they should communicate.

This was a minor but an important reason among others why it was desirable to found an organization which would be representative of absolutely the best traditions in the medical profession, and of its best New-World thought in this particular field.

Preliminary arrangements were made at this time, when Dr. William H. Welch, who was chairman, was empowered to appoint a committee. And these gentlemen were to report at a second meeting in Philadelphia in March of 1904, when some hundred physicians were gathered from many parts of the United States. Dr. William Osler presided on this occasion.

Not only the medical but the manifold sociological and economic aspects of this subject—so world-embracing in its scope—were discussed, and the sentiment that was pervasive of this meeting was again one of practical humanitarianism. To a second committee was delegated the business of preparing a constitution and by-laws upon which the new association should be founded.

And again, as at Baltimore, the deliberations of this body were conducted amidst an inspiring environment in the Philadelphia College

of Physicians, an institution impressive in its traditions, dignified in its material appointments, and its ivy-stained, time-softened architecture. While I sat there, the late afternoon sun mellowing the assembly chamber, I could not but reflect upon another historic occasion, held more than a century ago, in another structure but a few rods away. In both was manifested a like lofty spirit. The former body deliberated concerning the emancipation of a nation, though no man hoped otherwise than that many lives would have to be sacrificed and that much suffering must inevitably ensue. The latter was concerned with the welfare of a race, and its confident deliberations were to the end that much anguish of body and of soul should not come to pass and that many millions should not die untimely.

At a third meeting, in June of 1904, at Atlantic City, the National Association for the Study and Prevention of Tuberculosis was definitely founded. Dr. Trudeau, whom all delighted to honor, was made the president, Dr. Osler and Dr. Biggs the vice-presidents, Surgeon-General Sternberg the treasurer, and Dr. Jacobs the secretary. It was said that among the several hundred men present, perhaps one-third had been sufferers from consumption, and were now very robust proofs of the curability of this disease. These men, Trudeau, Flick, Bullock, and others, were now devoting their lives to the restoration of their afflicted fellows. Many parts of the country were represented. Among the speakers was a physician from the Black Belt, who declared with gratification that at last something was being done in his section to help the consumptive negroes among whom he practised.

In May of 1905 the thoroughly organized Association had its second annual meeting in Washington,—an event, I believe, truly epochal in the history of civilization. In that splendid capitol, a fitting setting for such enterprise, several hundred physicians, scientists, and devoted laymen, under the presidency of Dr. Trudeau, manifested in their deliberations the same combination of altruism and sane endeavor that has evidenced this movement from its incipiency.

There were sociological, clinical, climatological, pathological, and bacteriological sections, in which memorable papers were read and discussed by men of the first rank in their life-work. Among these addresses was that on Channels of Infection in Tuberculosis, by Dr. William H. Welch. One seldom hears, even among those whose calling it is to stir the heart and the emotions, so lucid and earnest a speaker, nor one so eloquent as this physician, who spoke upon a purely scientific subject,—an extempore address which, however, like a Beethoven number, would have been marred by the loss of a single

note. Nor is one likely ever to have seen an audience so tensely interested as that which burst into tumultuous applause at the end of this masterpiece of logical exposition.

Dr. Trudeau, in his address, declared,—

“The ‘great white plague’ has ever been so gigantic and hopeless a problem that until recent years men have accepted the holocaust of human life which it has ever claimed, and the terrible suffering it entails on humanity, as an inevitable decree of fate, and have either looked on with Oriental fatalism, or turned their heads and passed by on the other side with a hopelessness born of despair and of ignorance as to the etiology of the disease.”

But now consistent, rational, concerted activities were to proceed in the expectation that consumption might become, even in the lifetime of many who were present, an affliction as rare as those which in other ages have been the scourges of the race of men. Thus, then, was begun the work of this beneficent organization; and no well-wisher for his kind will contemplate it without a stirring and grateful realization that it promises to be nothing short of monumental in human history.

Part XIV

SCIENTIFIC RÉSUMÉ

Science is the pillar of fire which lights the way.

CASIMIR-PERIER

The method of science has permeated all regions of thought and animated all of the commercial, industrial, political, social, and religious activities of men. Whether we welcome it, deplore it, or indifferently acquiesce in it, the fact seems undeniable that the method of science and the doctrine of evolution are the most effective sources of the intellectual enterprise of our day.

WOODWARD

CHAPTER I

EARLY DIAGNOSIS¹

“To ward off the calamity of disease and to prevent the spread of a pestilence is to increase the sum of human happiness and to elevate the race.”

THE following authoritative report upon this subject was presented at Washington before the National Association for the Study and Prevention of Tuberculosis by Dr. A. C. Klebs, whose associates were Drs. J. H. Musser, F. Billings, J. C. Wilson, and H. R. M. Landis.

The diagnosis of phthisis, of that well-developed stage of pulmonary tuberculosis, offers no difficulty whatever. The symptoms are well marked and typical, the pulmonary signs easily discoverable. The expectoration contains bacilli. The clinical picture is so typical that mistakes in diagnosis cannot well be made, even by the superficially trained observer. But this stage of pathological development in the great majority of cases is reached only after very long periods, during which all signs and symptoms are less typical, less marked from that time on when infection took place. During this time, which marks the true incipency of the malady and which anatomically is characterized by the formation of few isolated tubercles in lymph glands or lung tissue, no or only vague general symptoms exist,—none on which to base a positive diagnosis of the disease. Investigation has shown that such infections are of very frequent occurrence, and that only in a comparatively small percentage of these cases does the disease develop further. However, this percentage is sufficiently large to make tuberculosis the most destructive of all diseases, and the demonstration of its frequent and spontaneous arrest, and of its curability by certain therapeutic measures at an early period of its development, must induce efforts of recognition long before the stage of phthisis is reached.

The discovery of the tubercle bacillus in the sputum of patients suffering from the disease constitutes a diagnostic means of indisputable accuracy. However, the consideration alone of the fact that tubercle bacilli can appear in the sputum only after the caseification and breaking down of a tubercle situated near a bronchus or bronchiolus makes it certain that tuberculous changes occur previous to the

¹This chapter and the one following will probably interest only the physician.

appearance of the bacillus in the sputum. This is borne out also by the clinical observation of a recognizable stage of tuberculous lung involvement before bacilli are found in the sputum, and the adoption of the term "closed," designating this stage, in opposition to "open"—*i.e.*, with bacilli found in the sputum,—can be recommended for a more general introduction.

From the therapeutic stand-point the diagnosis of pulmonary tuberculosis in its closed stage is of the utmost importance, the chances of permanent recovery diminishing proportionally with the postponement of rational therapeutic measures. These measures, being on the whole nothing but a radical change in the patient's mode of life, will also interfere less with the patient's usual occupations the earlier the diagnosis is made. Hence, also, for this reason, the paramount importance of an early diagnosis. The physician who declines to make a positive diagnosis of tuberculosis on account of the absence of the bacillus in the sputum only, assumes a very grave responsibility, and great caution in this respect cannot be urged sufficiently. Whenever certain signs and symptoms justify a suspicion of the disease, without there being positive evidence, it is wise to instruct the patient carefully as to his mode of life, to watch him closely, and to repeat the examination at stated intervals.

As regards the examination, it may be said in general that a close and careful investigation of constitutional as well as local manifestations by the simplest methods will often reveal sufficient evidence for a positive diagnosis. The search for bacilli in the sputum has unfortunately brought about a neglect of these methods.

The history of the patient may or may not contain useful information. It ought to be carefully investigated in every case. Predisposing moments, such as cases of tuberculosis in the family and among intimates, or unhygienic mode of life, dusty and confining occupations, must all be taken into consideration; their absence in one case, on the other hand, must not discourage further examination.

The symptoms of incipient tuberculosis will rarely offer anything typical. We may have a very early hoarseness or a condition resembling that of chlorosis or neurasthenia, of bronchitis or dyspepsia. Cough may, or may not, be present. Hæmoptysis, in the absence of other causes, among all the symptoms which may be found in the history, is one of the greatest significance. Physical signs are sometimes absent for weeks after the hæmoptysis. Vague as all these symptoms may be, and characteristic of various morbid conditions, they assume diagnostic value only when considered together with the results of a careful physical examination.

Here inspection, first of all, will have to reveal conditions of stature and physical development, which in their deficiencies we know to be indicative, if not of the disease itself, at least of a predisposition to it. Length and weight of body (p. 374), circumference and degree of expansion of chest, are data of importance, and in their correlation give indication of the bodily condition and state of nutrition. Still, we must not depend on finding often the classical *habitus phthisicus*, the paralytic thorax, if we are to make an early diagnosis of tuberculosis. However, these data, as well as the determination of symptoms, are of greatest value if for nothing else but a guidance in subsequent examinations, and for that reason should not be neglected in any case.

Of great importance is the temperature. Even a slight rise of temperature in the afternoon, if other causes can be excluded, ought to arouse invariably our suspicions. Very often this is overlooked, and to shield against such oversight great care in the measuring of the temperature is to be recommended. Whenever possible a two-hourly record for a period of several days ought to be taken, a good thermometer to be placed in the mouth with tightly closed lips and held there for at least five minutes, the patient in a room of even temperature. It will also have to be remembered that in some tuberculous patients the rise of temperature appears only after some exercise,—in women before and at the time of menstruation.

The physical examination of the chest by inspection, palpation, percussion, and auscultation, if carefully and properly performed, will give more direct evidence than other methods. It may be said here that the newer methods of examination, notably that with the Roentgen rays, cannot, at least in their present state of development, claim superiority over the results obtained by the above-mentioned methods.

Attention will be called here only to a few signs indicating limited lung involvement. On inspection very often a retardation in the respiratory movements over the affected lung portion can be observed, especially over one apex. This retardation is more pronounced in a more recent involvement of the corresponding area of the lung (Turban). Foci of greater extent diminish the excursions of the diaphragm of the affected side. This can be demonstrated on the fluorescent screen, but equally well and without apparatus by the observation of the diaphragmatic excursions by means of Litten's shadow.

The vocal fremitus in early pulmonary tuberculosis gives little information. It may be increased or decreased over areas of pleural thickening; over pleuritic exudations it is always diminished.

Painstaking percussion and auscultation of the chest over all parts, and always comparing the two sides, is of the greatest value. The

use of the blue pencil for marking the border lines and determining the excursions of the lungs cannot too strongly be urged. Strong percussion, on the whole, should be avoided. Marked dulness is but rarely found over portions of the lungs in incipient tuberculosis. However, the percussion will elicit sometimes a significant retraction of one apex as compared with the other.

In judging the results of the examination by auscultation, it should always be remembered that many of the signs are subject to considerable variation, depending on the time at which the examination is made. Râles, which we can easily discover in the morning, will regularly be absent during the afternoon. Also on damp and rainy days we will find them when they are absent in drier weather. Also do we find in women pulmonary signs accentuated at the time of menstruation.

All these circumstances must be considered before a final judgment of the case is given.

Although every portion of the lung (including the lingula over the heart dulness) should be examined with the stethoscope, particular attention will have to be paid to the upper portions of the lungs and also to the lower borders and the axillary regions.

As the earliest auscultatory sign in early pulmonary tuberculosis we can regard the rough and the slightly diminished respiratory murmur. The former must not be confounded with the sharp (puerile) respiratory murmur, which is more a sign of increased function than of swelling of the mucosa. Both are vesicular sounds. The rough character is produced by a succession of murmurs, following each other too rapidly for aural differentiation. Is the succession less rapid, then we speak of an interrupted respiratory murmur, which suggests much coarser changes. Thus the rough murmur changes the character of the respiratory sound. It loses its "smooth" quality and becomes "impure and roughened" (Sahli.) When these adventitious sounds become audible besides the vesicular murmur, then we can speak of râles. The rough murmur is produced by slight inflammatory changes in the bronchioli, the air passing over an uneven surface and through a slightly narrowed lumen. It is principally audible during inspiration over the apices and below the clavicles. This murmur precedes the appearance of râles (not the case, as a rule, with the puerile murmur), and thus is the earliest auscultatory manifestation of tubercular involvement of the air-passages. Distinct attention should therefore be paid to it. The appearance of râles over the apices (also in the axillary region) is next to it in importance. Râles indicate catarrhal conditions. With them the intensity of the vesicular mur-

mur is usually diminished, which is also produced by the more pronounced swelling of the bronchial mucosa. In the earliest stages we hear usually fine crackling râles. They can often only be heard directly after the patient has coughed.

Bronchial respiration we hear but rarely in early tuberculosis. When it appears, we have to deal with a more extensive process. By its localization in the apices and together with other signs it is, of course, pathognomic of consolidation. The same may also be said as regards the other deviation from the normal respiratory murmurs which are indicative of profound tissue changes, to discuss which does not come within the scope of this report. On the other hand, pleuritic friction is often heard at an early period, most frequently in or near the axillary line between the sixth and eighth ribs.

Only passing mention can be made of other diagnostic methods, of which tuberculin is the most important. Although it is well understood that by injection of small doses of tuberculin, and by the febrile reaction thus produced in tuberculous individuals, we can diagnose early tuberculosis, the method necessitates great care in its application and an apparatus too complicated for general use, so that it does not lend itself to a more general introduction. The dangers of the preparation in the hands of one well acquainted with the method are very slight, but by applying carefully the other means of observation and examination, a case will rarely be found in which it would add considerably to the information gained.

The fact that certain salts, especially iodine salts, increase catarrhal symptoms, and thus make them more perceptible to auscultation, has led to their administration for diagnostic purposes. For similar reasons as the above stated, a general introduction of this method cannot be recommended.

The examination with X-ray has the drawback of a complicated apparatus. Besides, its value over the other methods has not yet been satisfactorily demonstrated. Various other methods have been advocated for the early detection of tuberculosis,—inascopy, sphygmography, sphygmomanometry, serum test, etc.,—all apt to increase our knowledge of the disease, but of no practical advantage in the every-day diagnosis of so frequent a disease. The careful and painstaking application of the methods well taught and well understood, with the simplest apparatus, but applied with a broad conception of the pathogenesis of the disease, will bring about much earlier diagnoses than are usually made.

CHAPTER II

CLASSIFICATION OF CASES AND TECHNIQUE OF EXAMINATIONS

“It would tend to uniformity of scientific results if all physicians would adopt the scheme here proposed.”

THE report of the nomenclature committee of the National Association for the Study and Prevention of Tuberculosis was presented at Washington by Dr. Vincent Y. Bowditch, whose associates were Drs. Lawrason Brown, G. W. Norris, H. M. King, W. H. Bergtold, and J. H. Pryor. The trial for one year of Dr. Turban's scheme here set forth was urged, with the prospect of a report at the next annual meeting concerning its success or otherwise. The first part—classifying incipient (favorable), moderately advanced, advanced cases, and miliary tuberculosis—is to be used on the admission of a patient to an institution. The classification in conformity with Turban's scheme proposed by the committee, as here set forth, should be used on the patient's discharge. In the discussion upon this report the word “favorable” was advanced—with general approval, I think—as being preferable to “incipient.”

REPORT.

INCIPIENT (FAVORABLE)

Slight initial lesion in the form of infiltration limited to the apex or a small part of one lobe.

No tuberculous complications. Slight or no constitutional symptoms (particularly including gastric or intestinal disturbances or rapid loss of weight).

Slight or no elevation of temperature or acceleration of pulse at any time during the twenty-four hours, especially after rest.

Expectoration usually small in amount or absent.

Tubercle bacilli may be present or absent.

No marked impairment of function, either local or constitutional.

MODERATELY ADVANCED

Localized consolidation moderate in extent with little or no evidence of destruction of tissue ;

Or disseminated fibroid deposits.

No serious complications.

REPORT.—(Continued.)

FAR ADVANCED	}	Marked impairment of function, local and constitutional. Localized consolidation intense ; Or disseminated areas of softening ; Or serious complications.
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ACUTE MILIARY TUBERCULOSIS.

Translation, with some Modifications, of Turban's Scheme for a Method of Comparative Statistics for Pulmonary Tuberculosis. (From "Tuberculosis," monthly publication of the Central International Bureau for the Prevention of Consumption, September, 1904. Johann Ambrosius Barth, Leipzig.)

Suggested for use in the National Association, with the addition of the scheme offered by the Committee.

1	Extent of disease in the lungs,	I II III	For exact definition, see below.
2	How long consumptive?	3 months.	Period to date from the observation of the first clinical symptoms,— <i>e.g.</i> , stubborn coughing, hæmoptysis, pleurisy, loss of flesh,, etc.
3	General condition of the patient,	A X	A = favorable. X = unfavorable.
4	General digestion,	B Y	B = unimpaired. Y = impaired.
5	General pulse,		The pulse is to be registered every morning and evening, the patient resting.
6	General temperature,	F f t n	F = maxima for the day over 101° F. f = maxima for the day from 99° F. to 101° F. t n = normal temperature (mouth).
7	Tubercle bacilli,	+ 0	+ = tubercle bacilli present. 0 = tubercle bacilli absent.
8	Tuberculous complications,	Larynx.	Name of the organ suffering from tuberculosis.
9	Other complications,	. . .	Name of the disease.
10	Result of treatment,	<i>vide</i>	Classification of Results of Treatment proposed by Committee on Nomenclature.

Definition of the extent of disease in lungs, according to Turban :

I. Slight lesion extending at most to the volume of one lobe or two half lobes.

II. Slight lesion extending further than I, but at most to the volume of two lobes; or severe lesion extending at most to the volume of one lobe.

III. All lesions which in extent of the parts affected exceed II.

By "slight lesion" we understand disseminated centres of disease which manifest themselves physically by slight dulness, by harsh, feeble, or broncho-vesicular breathing, and by râles.

By "severe lesion" we mean cases of consolidation and excavation such as betray themselves by marked dulness, by tympanitic sounds, by very feeble broncho-vesicular, bronchial, or amphoric breathing, by râles of various kinds.

Purely pleuritic dulness, unless marked, is to be left out of account; if it is serious, the pleurisy must be specially mentioned under the head of "tuberculous complications."

The volume of a single lobe is always regarded as equivalent to the volume of two half lobes, etc.

BY THE COMMITTEE.

Proposed Classification of Cases and Results of Treatment in Pulmonary Tuberculosis, to be used in Connection with Turban's Scheme.
On discharge:

Progressive: (Unimproved.) All essential symptoms and signs unabated or increased.

Improved: Constitutional symptoms lessened or entirely absent; physical signs improved or unchanged; cough and expectoration with bacilli usually present.

Arrested: Absence of all constitutional symptoms; expectoration and bacilli may or may not be present; physical signs stationary or retrogressive; the foregoing conditions to have existed for at least *two* months.¹

Apparently cured: All constitutional symptoms and expectoration with bacilli absent for a period of *three* months; the physical signs to be those of a healed lesion.

Cured: All constitutional symptoms and expectoration with bacilli absent for a period of two years under ordinary conditions of life.

An example is here shown (Fig. 109) of how a given case might

¹ The length of time mentioned is of course somewhat arbitrary, but is intended to cover the cases which frequently occur, where the patients leave a sanatorium for various reasons, contrary to advice, after a stay of a few weeks, although all active symptoms may have ceased completely soon after entrance.

PLAN SUGGESTED BY COMMITTEE ON NOMENCLATURE FOR TABULATION OF CASES FOLLOWING TURBAN'S SCHEME.

FIG. 109.

Name	Condition.	Amount of Involvement.	Duration of Disease.	General Condition.	Digestion.	Range of Pulse.	Maximum Temperature for Day.	T. B.*	Complications.	
									Non-tuberculous.	Tuberculous.
Mr. X.	On admission.	"Moderately advanced."	Three months.	Favorable.	Impaired.	76-100	100°	+	Negative.	Negative.
	At discharge.	"Arrested."	Nine months.	Favorable.	Unimpaired.	76	98.6°	0

* Absence or presence of tubercle bacilli to be determined only after repeated examinations while patient is under observation.

be tabulated. Such tabulation, it will be seen, is rather a description than a classification.

This method of history-taking, with monthly summary, is in use at the Massachusetts State Sanatorium (Figs. 110, 111). There are, in addition, cards for recording temperature, pulse, and weight, with

FIG. 110.

No. MASSACHUSETTS STATE SANATORIUM.			
Name	Married	Age	Dates { First Exam Entrance Exit
Residence	Dependents		
Environment	Occupation	Stopped Work	Birthplace
Physician	Friend		
Sent by	Ancestry		In U. S.
Habits and Prev. Tr'tm't			
Prev. Diseases			
Family History (Tubercular) M.S. F.B.—M.M. M.F.—M.S. M.B.—F.M. F.F.—F.S. F.B.—Children			
SYMPTOMS: BEFORE AND AT ENTRANCE: IN SANATORIUM: AT EXIT:			
Cough			
Sputa			
T. B.			
Temperature			
Chills			
Night Sweats			
Dyspnoea			
Pain			
Hæmoptysis			
Appetite			
Stomach			
Bowels			
Strength			
Sleep			
Anæmia			
Throat			
Glands			
Heart			
Menses			
Phthisis	Length of Stay	Result	

diagrams, such as here shown, upon which lesions may be depicted (Fig. 112). The physician may have stamps made of these diagrams,

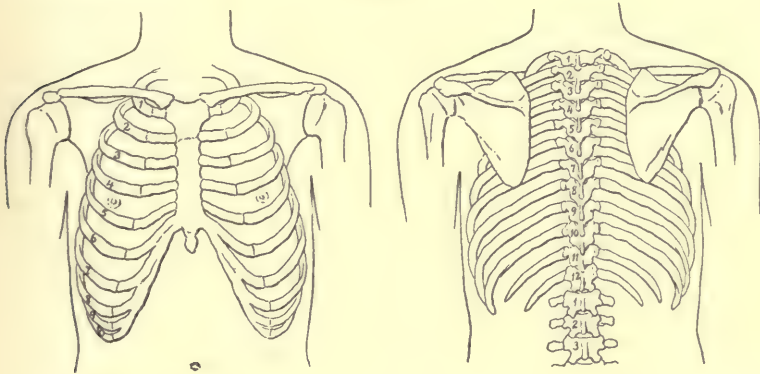
so that changes may from time to time be recorded upon repeated impressions.

FIG. 111.
MASSACHUSETTS STATE SANATORIUM.

No.		MONTHLY SUMMARY.	
Name		Date	
Cough		Chills	
Sputa		N. Sweats	
Hæmopt.		Strength	
Dyspnœa		Heart	
Appetite		Glands	
Stomach		Menses	
Bowels		Sleep	
Pain		Aspect	
Throat			
Ph. Exam. and Remarks		Weight	
		Chest Expan.	
		Chest Capacity	
		Exercise	
Medicine			
Spec. Diet		Eggs	Milk

A number of systems of symbols and abbreviations have been devised by Knopf, Elliot, and others. The physician will probably find that simplification will be best effected by selecting and mastering only a few signs.

FIG. 112.



Every practitioner will modify the suggestions here set forth for use in his private work. My own case histories are made upon

printed cards, containing the salient points here given, four by eight inches, which fit exactly into one of my desk drawers. In addition are blank cards for observations during the progress of the case, which can be clipped with the first, upon which the history is taken.

Every medical man has, or should have, firmly implanted in his memory some skeleton upon which to hang his physical diagnosis. The following concerning the lungs was taught me in my student days by Dr. Abraham Zemansky.

PHYSICAL SIGNS.

1.

Inspection.

Color of skin—
 Blanching,
 Cyanosis,
 Icterus,
 Pigmentation.
 Shape of chest—
 Dilatation,
 Contraction,
 Local depression.
 Irregularity of chest expansion.
 Frequency of respiration.

2.

Palpation.

Inequality of chest expansion.
 Vocal fremitus—
 Increased,
 Diminished,
 Absent.
 Pleural fremitus.
 Bronchial fremitus.

3.

Percussion.

(Pitch and Quality.)

Dulness.
 Flatness.
 Tympanitic resonance.
 Vesiculo-tympanitic resonance.
 Cracked-pot resonance.

4.

Auscultation of Breathing.

Intensity—
 Exaggerated,
 Diminished,
 Absent.
 Rhythm—
 Interrupted,
 Expiration prolonged.
 Quality—
 Rude,
 Bronchial,
 Cavernous,
 Amphoric.

5.

Auscultation of voice and whisper.

Diminished intensity—
 Weak or feeble,
 Absent.
 Increased intensity—
 Exaggerated,
 Bronchophony,
 Pectoriloquy,
 Egophony.

6.

Mensuration.

7.

Succussion.

8.

Râles.

Dry—
 Sonorous and sibilant.
 Moist—
 Mucous, crepitant, sub-crepitant, and gurgles.
 Pleural (various).

TUBERCULIN.

In non-tuberculous subjects an injection of 0.25 C.c. induces a severe reaction; 0.01 C.c. produces no reaction. In the tuberculous, reaction occurs with 0.001 C.c. and declares itself within four or five hours by general symptoms,—rise of temperature to 102° – 104° (usually after a preliminary chill), pain in the limbs, weariness, cough, often nausea and vomiting, occasionally cerebral symptoms. These last about half a day. There are also local reactions—externally, redness, swelling, exudation—which subsequently harden into crusts and scabs and fall off; pulmonary foci give râles, increase of dulness, of cough and expectoration, and perhaps tubercle bacilli in the sputum. Rarely tuberculin injections will not detect tuberculosis.

TO STAIN THE TUBERCLE BACILLUS.

The best process of staining the bacilli is the Ziehl-Neelsen method, as follows: Spread out the small, yellow, caseous-looking points of the sputum by pressure between two cover-glasses. A thin film will remain on each when the glasses are slipped over each other apart. The glasses should then be dried and passed rapidly through the flame of a spirit-lamp, care being taken not to scorch the film. The cover-glasses should then be floated, film downward, on a solution made up as follows: Saturated alcoholic solution of basic fuchsin, 1 part; absolute alcohol or rectified spirits, 10 parts; 5 per cent. carbolic acid solution, 10 parts.¹ This fluid is well mixed and a small quantity filtered into a watch-glass, on which the film is floated as above described. If time be an object, gently heat the fluid over a Bunsen burner or spirit-lamp until steam rises; then drop the film upon the surface, and at the end of from three to five minutes the bacilli will be well stained. Or put a few drops of the stain upon the cover-glass, hold it by forceps over the flame, heating and reheating it, as with the watch-glass. If time be not an object, or if sections are to be stained, the preparation should be left in the fluid from twelve to twenty-four hours. The preparation is then transferred to a watery twenty-five per cent. solution of sulphuric acid, when the pink rapidly becomes a yellowish-brown tinge. Keep the cover-glass in motion to facilitate this change. When the decolorization is complete, there should be no return of the pink on plunging the specimen into a bowl of water to which a drop of ammonia has

¹Or this formula: Concentrated alcoholic solution of fuchsin, 10 C.c.; five per cent. aqueous solution of carbolic acid, 90 C.c.

been added. It may be necessary to return the specimen once or twice to the acid before this end is attained. After thoroughly rinsing in this slightly alkaline water the specimen may be counterstained for from thirty seconds to a minute in a dilute watery solution of methylene-blue. It should then be washed in water, carefully dried, and mounted in Canada balsam. The bacilli may now be seen under the microscope standing out as bright red rods in a blue background of débris, pus-corpuscles, and cells.

CHAPTER III

PURE MILK

“While consumption is mainly of human propagation, bovine tuberculosis contributes a source of infection to a degree which cannot be ignored.”

THE means of pasteurization devised by Dr. Rowland G. Freeman, to whose paper the reader may refer for details, should be employed wherever the purity of milk is in question. No thermometer is required, the apparatus being based on the fact that if two fluids at different temperatures are placed in contact these two temperatures will be equalized. By inversion in a definite amount of boiling water (the

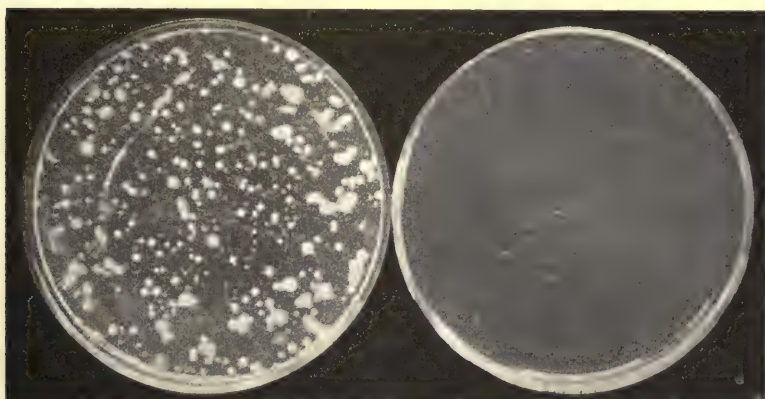


FIG. 113.—Petri plates illustrating the efficacy of pasteurization at 68° C. for thirty minutes in destroying the bacteria of milk (Freeman). *a*. Photograph of a plate twenty-four hours after planting with 1-20 C.c. of raw milk.—7411 colonies are visible. *b*. Photograph of a plate twenty-four hours after planting with 1-20 C.c. of the same milk after pasteurization for thirty minutes at 68° C.,—no colonies are visible.

source of heat having been removed), a properly proportioned amount of cold milk is introduced in bottles under such conditions that they will not break, with the result that the milk is raised to about 68° C. (155° F.). This procedure obviates the injurious chemical changes which are said to begin in milk at 80° C. Moreover, milk pasteurized as indicated for twenty minutes is fairly sterile; and this temperature is sufficient to destroy the pathogenic germs which are most feared in milk, including the bacillus tuberculosis. By pasteurization below

70° C. the original flavor and taste of the milk is retained,—an important practical consideration.¹

The consumptive mother must be instructed to take great precautions concerning the feeding of her infant. Condensed milk, or loose milk sold in grocery stores, should not be used. The mother should not take into her mouth the rubber nipple; she should not taste the food she prepares and then feed the child with the same spoon; she should not blow upon the food to cool it.

The New York Health Department has prepared for distribution an admirable circular in which details concerning the care and feeding of infants and little children among the city's poor, and the arrangements made by the Strauss benefaction to these ends, are set forth.

With regard to the inspection of milk which this department undertakes it is to be noted that millions of quarts are consumed every week in the metropolis, and that some of this vast quantity comes from a distance of five hundred miles and is twenty-four hours old when it reaches its destination.² The inspectors of the department are exceedingly active and careful in the exclusion of impure milk; nevertheless, it is obvious that the formation of a corps sufficiently large to examine all the sources from which this milk is derived is impossible. However, the city's milk receives careful examination. An enormous quantity—three thousand cans in a single night—has been poured into the sewers by order of the inspectors because its temperature, when it reached town, was above 50° F. In one instance a whole train-load was condemned on its arrival. Naturally there is some complaint among the milk dealers, who declare that the quantity seized and condemned is sometimes so great that they are unable to supply customers. They declare that the inspectors would find the milk all right, so far as the temperature is concerned, if they go to the stores from which it is distributed, instead of taking it directly from the wagon when it enters the city; and that while it is in transit from the car to the distributing point it is difficult to keep it cool. The Board's object in declaring milk above 50° F. adulterated,

¹The thermal death-point of the tubercle bacillus in a moist medium is found by Grancher and Lidoux-Libard to be 70° C. for one minute; by Yersin 70° C. for ten minutes; by Bitter 68.5° C. for twenty minutes; by Forster 65° C. for fifteen minutes; by Bonhoff 60° C. for twenty minutes; by Schroeder 60° C. for fifteen minutes. These variations are in part due to sputum being the medium; the varying virulence of the bacilli; the use of bovine bacilli by some and human bacilli by others; the test of life of the bacillus.

²Not only New York State, but also Massachusetts, Connecticut, New Jersey, Pennsylvania, and Delaware supply New York City.

and in thus strictly enforcing the regulation of the health code, which orders the condemnation of adulterated milk, is the prevention, as far as possible, of the intestinal diseases of children. In warm milk (above 50°) bacteria multiply in geometrical progression, and the Board considers that the milk should be cared for in such a way from cow to home (if we may use the phrase) that such diseases will not be engendered in infants.

The laboratories of the department are open daily for the free examination of milk samples; and details of examinations are furnished upon request, as is the case, I believe, with all the department's literature. The sanitary code, which it is the business of the Health Department to have enforced, requires that no such products as unwholesome, skimmed, watered, or adulterated milk, or swill milk, or milk from cows or other animals that for the most part have been kept in stables, or that have been fed in whole or in part on swill, or milk from sick or diseased animals, or any butter or cheese made from any such milk, shall be sold. The term "adulterated" here means: milk containing more than 88 per cent. water or fluids; or less than 12 per cent. milk solids; or less than 3 per cent. fats; or such as is drawn from animals within fifteen days before or five days after parturition; or milk drawn from animals fed on distillery waste or any substance in a state of fermentation or putrefaction, or on any unhealthy food; milk drawn from cows kept in a crowded or unhealthy condition; or milk from which any part of the cream has been removed; or such as has been adulterated with water or any other fluid or to which has been added, or into which has been introduced, any foreign substance whatever; or milk the temperature of which is higher than 50° F.

No adulterated condensed milk shall be "brought into, held, kept, or offered for sale in any place in the city of New York." Condensed milk is pure milk from which any part of the water has been removed and to which sugars have been added. And such milk is adulterated when the amount of fat is less than twenty-five per cent. of the milk solids contained therein, or to which any foreign substance whatever has been added, excepting sugars, as in preserved milk.

No milk of any sort shall be sold or delivered to the city without a written permit from the Health Department, for which application must be made. The restrictions noted apply also to cream, which is the fatty portion of pure milk rising to the surface when the milk is left at rest, or which is separated by other means. Adulterated cream is such as has had "any foreign substance" added to it.

The department requires that milk must not be stored or sold in any rooms used for sleeping or domestic purposes or opening into such

rooms ; that, except for the purchaser at the time of delivery, it must be transferred from cans or bottles or other vessels on streets or on ferries or at depots. The reasons for this care is that milk is an excellent culture medium for germs, and may thus readily transmit tuberculosis and other infections.

The milk bottles must be washed clean with a hot water solution of soap or soda or some other alkali, and then with hot water before filling with milk. They must not be filled except at the dairy or creamery, and in the city only in rooms so situated as to prevent the contamination of the milk by dust or other impurities from the streets or elsewhere. Nor may they be washed or filled with milk in rooms used for sleeping or domestic purposes.

The vessels in which milk is kept for sale must be suitably covered against dust or other impurities. Store permits must be publicly posted. Wagon permits must be carried whenever engaged in the sale or transportation of milk, and of length, width, and color as directed. At the end of the day's sale all cans, measures, and other utensils used in the sale of milk must be thoroughly cleansed with a solution of washing soda in lukewarm water,—a tablespoonful to a gallon. The overflow pipe from the ice-box in which the milk is kept must discharge, not into a drain pipe or sewer, but into an open water-supplied, properly-trapped, sewer-connected sink. The ice-box must be thoroughly scrubbed at least twice a week in the same manner as the milk bottles.

In selling milk the contents of the can should be thoroughly mixed. This will prevent unintentional skimming and will give with the last quart a fair amount of cream.

If in cold weather the milk is delivered to the dealer frozen, the ice from the sides of the can should be detached and the contents gently heated until the ice is all melted. This is essential if there is much ice in the can ; otherwise the part dipped out and sold at first will contain more of the solids of the milk and cream while the ice remaining, and consisting principally of water, will, after a time, melt, with the result that the remaining milk may appear to have been adulterated with water. For this reason also ice should not be placed in milk in order to cool it.

This Health Department's suggestions for testing milk are as follows :

BY THE CREAM GAUGE.

Fill the cream gauge one-half full with water, at 120° F., to which have been added a few drops of a strong solution of washing soda. Then, after stirring up the contents of the can of milk thor-

oughly, fill the gauge to the top mark with the milk. Shake well and place in very cold water (say 40° F.). In about thirty minutes the cream will have risen and the percentage can be read off, remembering that the result observed must be multiplied by two, as one-half water and one-half milk was used. Example: 8 per cent. of cream was observed by this test; multiplying this by two would be 16 per cent., which would be the true amount of cream contained in the milk. Good milk should show 14 to 18 per cent. of cream.

BY THE LACTOMETER.

To test for water the lactometer can be used as follows: Stir the milk to be tested so that a fair sample can be taken. Warm or cool enough milk to 60° F. to fill the testing cylinder. Insert the lactometer in the milk in the testing cylinder, being careful not to wet that part of the stem above the milk, and observe where it floats. Pure milk will not fall below the 100° mark at 60° temperature. It must be remembered that skimming the milk will make the lactometer float higher and the addition of water or cream may make it sink lower than 100° ; but if the appearance of the milk upon the lactometer is noted, no one can mistake watered milk for milk to which cream has been added, nor pure milk for milk from which the cream has been removed, as skim milk. In other words, if the lactometer floats below 100° and the milk looks thin, water has been added. If it floats above 100° and the milk looks thin, it may be skimmed, or skimmed and watered. But if it floats above 100° and looks creamy and yellow, and sticks to the glass, you can be reasonably sure that it is pure. Good average milk will indicate about 109° on the lactometer at a temperature of 60° F., and show about 14 per cent. of cream by the cream test given above.

The New York County Medical Society has appointed a commission to aid in improving the milk supply of the metropolis. And these eminent physicians have formulated requirements affecting the farms which they visit as a commission and the handling of the milk obtained at these farms. Those who comply with the requirements of this body are offered the right to use caps on their milk bottles stamped: "Certified" or "Inspected. Milk Commission, Medical Society, County of New York." These caps bear the name of the dairymen, so that any adulteration may be traced to its source. The requirements are in substance as follows:

The barnyard must contain no manure in summer and none in contact with the stable in winter; it must be well drained and kept reasonably clean.

The stables must have adequate ventilation and light; the floor must be of wood or cement; the ceiling tight, if a loft above is used; basins, hand-brushes, clean water, soap, and clean towels shall be provided in the barn or adjacent dairy-room; the stable shall be white-washed in the fall, and in the spring if deemed necessary; a sufficient number of lanterns shall be provided for proper milking; the ceilings and sidings are to be cleaned once a month; the bedding to be of shavings, saw-dust and dried leaves, cut straw or other approved material; the soiled bedding to be removed daily; the manure to be removed daily from the stalls and open manure gutter; covered manure gutters must be kept sanitary; the application of land plaster or lime on the floor daily is recommended; the entire floor outside of the stalls to be swept daily at least an hour before milking.

The water-supply must be pure for all purposes, accessible and abundant.

The Cows.—Milk containing mucus and that from any diseased cow must be discarded, as also milk from any animal forty-five days before and six days after calving; the food must be suitable both in amount and kind and must not give a disagreeable flavor to the milk; the cows must be kept clean on flanks, belly, udder, and tail; long hairs about udders must be clipped, as also the tail sufficiently to clear the ground; the cows must be kept from lying down between the cleaning and the milking (this is best done by throat-latching); the udder must be cleaned thoroughly before milking.

The Milkers.—No milker or assistant shall have any connection with the milk production at any stage if he has any communicable disease or if he has been exposed to scarlet fever, diphtheria, typhoid fever, or smallpox. After all preliminary preparation the hands must be thoroughly washed with soap, water, and brush before milking; the hands and teats must be kept dry during milking; if they become moistened with milk they must be wiped with a clean towel; suitable clean outer garments, such as overalls and jumpers, must be put on before milking.

Utensils.—Strainers—metal, gauze, or cotton—must be absolutely clean when used for straining milk; all dairy utensils must be absolutely clean and free from dust.

The milk must not be adulterated in any way; it must average 4 per cent. of butter fat; cooling must be begun within thirty minutes after the milking; the temperature must be reduced to 55° F. within two hours after milking and to 50° within three hours, and kept below that temperature until delivered to the consumer. When delivered the milk must not average over one hundred thousand

bacteria per C.c. from May 1 to September 30, and not over sixty thousand per C.c. from October 1 to April 30. If the commission's requirements are fulfilled, there will be no excess of the number permitted.

Inspections.—The farms must always be open to inspection by this commission, and samples of milk must be regularly submitted for bacteriological examination.

In order that the dealers and the commission may be kept informed of the character of the milk, specimens bought at random from the day's supply must be sent weekly to the Research Laboratory of the Health Department, where examination will be made by experts, these facilities being freely offered to this end. Latterly the Rockefeller Institute for Medical Research has also co-operated in this work.

Two certificates are granted by the commission. The first has the word "Certified" stamped upon it. This certified milk is inspected at the farms every three weeks and tested at the laboratory every week. It is supplied only in sealed bottles. All the cows giving it must have passed the tuberculin test. It is supposed to be produced under conditions as perfect as it is possible to obtain.

The second certificate carries the word "Inspected." The farms where this milk is produced are inspected every six to eight weeks and the milk examined at the laboratory every three to four weeks. Certain requirements of "certified" milk, such as metal caps for the bottles and sterilized gowns for the milkers, are omitted for this milk. It is, however, believed by the commission to be a wholesome and safe milk. As it will be retailed at the usual prices, it is hoped that every one will insist on his dealer supplying it to him.

"The milk commission has in its employ a trained inspector and has the use, free of charge, of the laboratories of the Department of Health. It can extend its work to any extent desirable. It remains for the public to decide whether or not it wishes to obtain pure milk."

One must not get the impression here that most dairies are unclean, or that the general tendency among dairymen is to be conscienceless. Such an impression is contrary to human nature as a whole. Many milkmen, moreover, have with wholesome business acumen realized that this examined product would bring a better price than the ordinary milk (usually twelve cents a quart), and many dairies have been inspected at the request of their owners, who find it profitable to conform to the commission's regulations. The dairymen defray the cost of the inspections, which is small.

CHAPTER IV

THE INSPECTION OF MILCH CATTLE AND OF MEATS

It is probable that the treatment and control of consumption will eventually come within the jurisdiction of State medicine, as is now the case generally with infectious diseases.—WILLIAMS.

A COMMISSION of eminent physicians made in 1898 an agreement with the Walker-Gordon Laboratory Company by which the former were to serve without compensation, receiving reports from a chemist, a veterinarian, a bacteriologist, and a physician concerning the production and transportation of the milk produced and sold by the latter. This commission was to select, appoint, and control these experts; should decide at what times and under what circumstances examinations should be made and reports rendered; should have power to institute investigations by other experts as it should deem fit; should permit such reports to be submitted to the profession at large in a strictly professional circular; but no circular, report, or advertisement in relation to "Walker-Gordon Guaranteed Milk" was to be issued to the general public without its approval. The company agreed to pay all the expenses of expert control and examination and of the publication of the reports. And this compact has since continued without modification from year to year.

Twice each month, at least, the bacteriologist examines the milk, the veterinarian makes an examination of the cows and horns, the visiting physician visits the farm and examines the employees, and the chemist determines the fat in the milk, and makes also full chemical analyses whenever the Commission require.

Concerning bacteriological counts, Dr. Freeman, who is engaged for this work, observes:

"It is well known to bacteriologists that even when milk is well agitated one can obtain moderately different results from different drops taken from the same bottle, while if counts are made from different bottles of the same day's supply a still greater variation may be obtained, so that counts represent only very roughly the number of bacteria ordinarily contained in the milk.

"It seems to me that while the counts of bacteria are exceedingly valuable as an exponent of cleanliness and proper handling of

milk, they should be used only to prevent carelessness at the dairy and to stimulate better methods and discipline.

“The opinion of a milk commission of representative men based on an actual knowledge of the management of the dairy is of vastly more value to the medical profession and to the public than any statement regarding the precise number of bacteria in the milk in any given day or days. The most important things, after all, are such a *régime* as shall make contamination by pathogenic organisms improbable, and at the same time insure that the milk is produced under such conditions of cleanliness that other bacterial contamination will be reduced to the minimum.”

At the request of this commission, Dr. C. J. Marshall formulated such regulations as seemed best to him to keep a dairy herd free from tuberculosis. This accomplished scientist finds the disease very prevalent in cattle. From ten to twenty-five per cent. of the dairy cattle in large districts in eastern States are thus afflicted,—in some herds the percentage being as high as ninety. It prevails most in breeding herds where purchases are made without inspection, and the cattle are kept from season to season so long as they are profitable and their progeny are reared; also in large herds where the cows are purchased without inspection in the open market. Tuberculosis is not confined to cows kept in poor premises and belonging to ignorant and careless men; it exists quite as extensively among the best cattle kept in good premises and under careful supervision unless recourse is had to the protection afforded by systematic use of the tuberculin test.¹

In most dairies the only precaution is to isolate visibly diseased animals. A cow may have the disease and may even furnish infectious milk for a long time before manifesting symptoms. Sometimes almost all the members of a dairy herd that had been carefully attended, well fed, and that appear to be healthy, are nevertheless in some degree tuberculous. This is shown by the researches conducted under such auspices as those of the United States Bureau of Animal Industry. Tubercle bacilli are often excreted from the udder even though this organ presents no clinical appearance of disease.

The careful, systematic use of the tuberculin test is essential if herds are to be kept entirely free from the disease. It is not sufficient to test a herd once and then to add to this herd no animals excepting those that fail to respond to the test. Even after such precautions are

¹ I know of a herd, kept under ideal conditions, of which more than half were slaughtered by order of its owner after the tuberculin test had been applied.

taken tuberculosis may enter a herd. All the reasons for this may not have been disclosed. A tuberculous cow, or one that has been exposed to the disease and is still in the incubative period, may, for instance, fail to respond to the test, and may be the means of infecting the herd if there be not a retesting within reasonable time. All the animals in a herd must be retested at intervals of not more than a year.

To maintain a large dairy herd free from tuberculosis is a very expensive procedure, and, therefore, one rarely undertaken. It is not merely the cost of the tuberculin, for this is a small item. The great expense is in discarding cows apparently in good health, often producing a large flow of milk, to which most people would take no exception. But as long as there is a possibility that the milk of such cows may be injurious, it is felt to be necessary that "guaranteed milk" should be above the slightest suspicion, so that people who buy such milk shall obtain milk which is beyond question pure and safe.

The herd maintained by the Walker-Gordon Company, at Plainsboro, New Jersey, was collected after the tuberculin test was established. This test has been employed at every step in the enlargement and development of the herd. Notwithstanding that all other sanitary conditions are maintained, every animal in the herd and every new-comer has been tested and retested in the manner indicated; and no milk of a suspected animal is used. The following are Dr. Marshall's regulations:

1. All cows added to the herd must be free from tuberculosis or other disease as shown by physical examination and tuberculin test. A test to be valid must be applied within the month before the time the cow is brought to the farm. The test may be applied by any veterinarian in good professional standing. It is to be made as follows: The normal temperature shall be established by at least two preliminary measurements made not less than two hours apart, and one shall be made before tuberculin is administered. No cow shall be tested that has a temperature above 103° F. The tuberculin shall be administered in the evening. At least three temperature measurements shall be made after tuberculin is injected, covering the period from the ninth to the sixteenth hour after injection. It is required that a full report on the inspection and test shall be sent to the superintendent of the farm. This report shall include a full and accurate description of each cow so that she may be identified and correlated with the report on her test.

2. All cattle shall be tagged when brought to the farm so that they may be identified, and a careful record shall be kept showing the facts

in regard to their origin, etc. Animals purchased under the conditions stated in Rule No. 1 shall be kept in a separate stable set apart

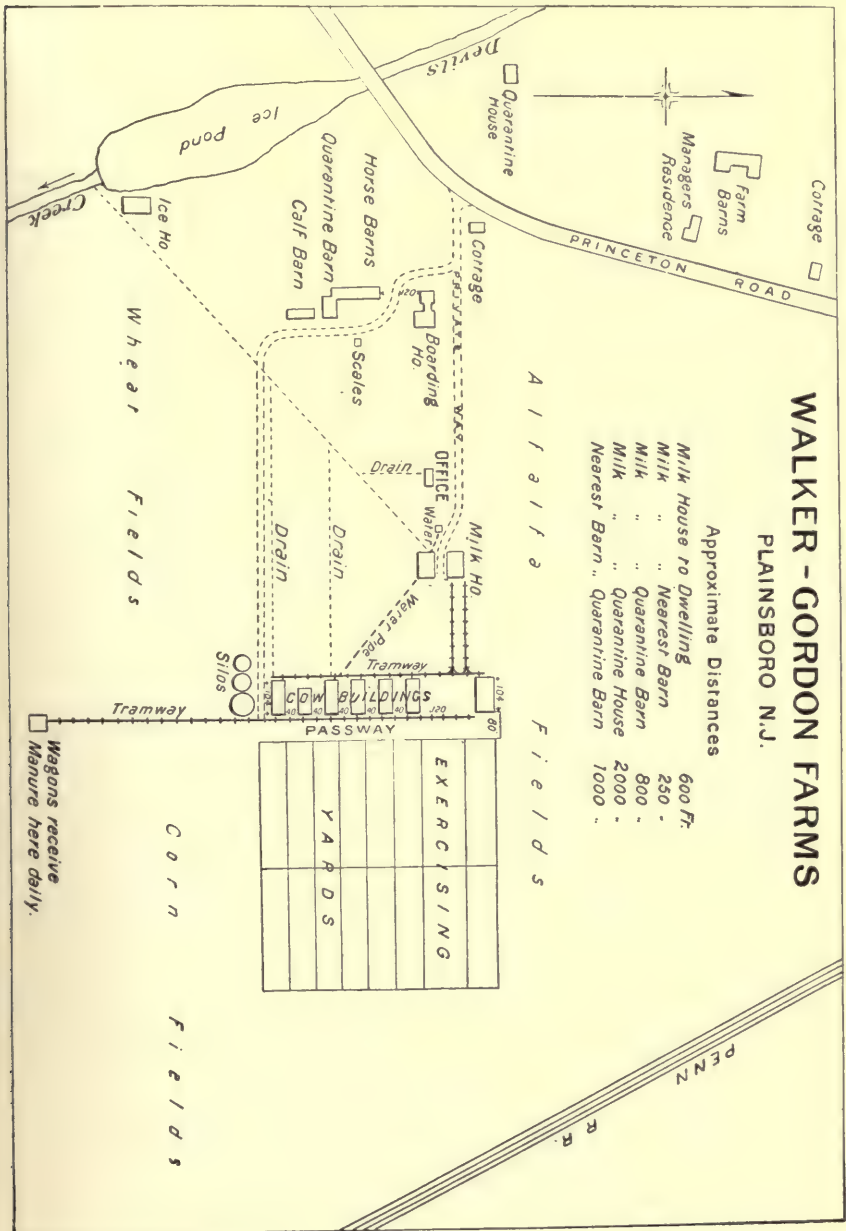


FIG. 114.

for this purpose and known as the *probation stable*. They shall not be admitted to the general herd, either in the milking stables or the

stables where dry stock are kept, until they have been retested by the veterinarian employed by the Commission. Such retests shall be made not later than two months from the time the cows are brought to the farm.

3. Cows that have not been tested with tuberculin may be purchased, but they must be held entirely apart from the herd in the building kept for this purpose until they have passed satisfactory inspection and the tuberculin test. Their milk shall not be used as guaranteed milk until this requirement has been fulfilled. After the first tuberculin test the cows that pass as satisfactory shall be kept under probation as is required under Rule No. 2.

4. Every animal in the herd shall be tested with tuberculin at least once each year by the veterinarian employed by the Commission. Any animal may be tested at any time when this is considered necessary by the attending veterinarian. The milk from an animal that fails to pass a satisfactory tuberculin test shall not be used as guaranteed milk, and the animal must be removed immediately from the herd. Cows that react to the tuberculin test shall not be stabled with non-reacting cows, either those that are milking or those that are dry. No stall or stable that has been occupied by a cow that has reacted to the test shall be occupied by a non-reacting cow until after it has been thoroughly disinfected.

5. The stalls from which reacting animals have been removed, and the immediately adjoining stalls, and the feeding floor in front of the whole section from which the reacting cow was removed, shall be scrubbed; and afterwards they shall be washed with a five per cent. solution of carbolic acid or some other equally efficient disinfectant.

Cornet, of Berlin, considers that the co-operation of the State is indispensable with regard to animal tuberculosis and its eradication. All infected animals should gradually be removed; and the recognition of the disease in them is ascertainable through the use of tuberculin. The margin of error with regard to the use of this serum is certainly not great—about 2.78 per cent.—and this margin becomes even smaller if we allow for errors in autopsies and in experimentation.

The temperatures of the animal under investigation should first be accurately determined by daily measurements, best taken toward evening, for one or more days before, and then injections of tuberculin should be made, ranging in strength according to the size of the animal,—for calves, 0.1; for cows, 0.5; for heavy bulls, 0.6 C.c. Animals with fever should not be subjected to the test. The reaction, which usually occurs within twelve to twenty hours, may be measured

after nine, twelve, fifteen, or eighteen hours. An increase of 1.5° C. above the normal, or a rise above 40° C. (104° F.), is evidence of tuberculosis, while a rise of less than 1.5° C. justifies a suspicion of the disease.

Observation has revealed that a subsequent inoculation, even months later, may give a doubtful reaction or even none at all, in spite of the fact that the animal has not recovered from the disease. Dishonest dealers, knowing this, give an animal which they wish to sell an earlier injection of tuberculin, thus rendering it immune to the dose which is preliminary to the sale. For this reason Cornet advises that the sale of tuberculin should be controlled by the government; should be made only to veterinarians for the express purpose of injecting for diagnosis and with a guarantee against fraudulent



FIG. 115.—Healthy cow.

use, and that the price of the serum should be made exceedingly low so as to facilitate its more general use. The inoculation should always be performed by an experienced veterinarian. The animals so tested, both those reacting and those that do not, should be marked in a manner denoting the date and the result of inoculation.

All animals found to be tuberculous should be separated as far as possible from the others, in order to prevent the spread of infection. Early slaughter would be the safest means, and would also serve the best interests of the owner, since the animal both assimilates less food and gives less milk as the disease progresses, and thus continually loses in value. Practically, however, it is necessary to restrict this measure. The disease has become so widely disseminated, involving as many as fifty or seventy per cent. or even more of some herds

of cattle, that the sudden swamping of the market with meat would result in a considerable fall in price and a corresponding loss in property to the owner. Chief stress, therefore, should be laid on the separation of the diseased cattle from their offspring. There should be partial remuneration by means of mutual—perhaps compulsory—insurance, for the pecuniary loss incident to the possession of tuberculous cattle, and there should also be premiums upon the possession of healthy herds. In order to obviate the dangers from tuberculous meat there should be a general inspection of all meat offered for sale, and diseased specimens should be rejected.

All meats should be rejected as dangerous to health and useful only for manufacturing purposes, if the meat itself appear diseased,



FIG. 116.—Diseased cow (note the arched back).

if the bones contain pearly nodules, or if the disease is general and severe, involving more than one of the body cavities and being associated with much emaciation. Such meat should not be used either fresh or cooked, or eaten by either men or animals.

If the disease involves two of the body cavities, but without necessitating the assumption of a dissemination by means of the greater circulation,—if, moreover, there is no emaciation and the meat appears to be sound, it may be designated as of inferior quality, but not dangerous to health. Such meat is sold only after having been cooked in a steam chamber, cut up into pieces weighing not more than five kilogrammes, for half an hour, at 100° C.

If the tuberculosis is confined to only one of the body cavities, or to a single organ, so that dissemination by the greater circulation may be excluded, the meat is to be considered neither detrimental to

health nor of inferior quality; and such meat may be freely offered for sale, after elimination of the diseased portions.

Milk, butter, and whey establishments should also be subject to supervision, with reference to the cows from which the milk is obtained. Here, too, the individual can protect himself from infection, either by getting his milk and the milk products entirely from establishments under official supervision or by heating the milk sufficiently before using it (pasteurization).

“Every farmer and cattle-owner can contribute largely to the improvement of conditions within the narrow sphere of his own possessions, by acting in the spirit of the preceding rules.” He should isolate his coughing cattle which have infected nasal mucus; tuberculous men and girls should not tend his cattle or milk them; and consumptives should be rigorously excluded from his stables.

CHAPTER V

RETROSPECT

The sires of future generations must make themselves the bondmen of rules which curb their desires and curtail their personal liberties.—WRIGHT.

WE may note, in a review of ante-natal conditions, that fresh parental blood, and all that it connotes, will generally beget healthy offspring, having tissues resistant to pathogenic agencies. Impure blood and its associations in the parents will too often result in degenerated tissues in the offspring. This is true for other diseases in which a vicious nutrition is transmitted,—syphilis, alcoholism, epilepsy, asthma, insanity, and cancer, as well as tuberculosis. There is then no reason why the influence of heredity in the latter should be ignored.

I think that the terms scrofula and tuberculosis are by no means always synonymous. They are not the same disease, simply because they often coexist. The latter term is meaningless unless it implies the presence of the Koch bacillus; and this, I believe, is by no means invariably the case in scrofula. This latter term may be unfortunate; but there is none other which represents as it does a distinct entity upon which the tubercle bacillus is often but not always implanted. The scrofulous constitution is sensitive to all irritants and infections, not only to tubercular infection. Struma is largely a transmitted condition. Children are born manifesting it. In some proportion of cases there is congenital infection; but in most cases there is no such infection. The parents may transmit a baneful influence by toxins; but toxins cannot generate bacilli. Children are born with the scrofulous temperament, upon which many other factors soon react as complications; these factors we have set forth. Under such conditions the tubercle bacillus becomes easily implanted; then skin lesions, abscesses, enlarged joints, and the like, follow. The scrofulous child is seldom born with these lesions.

With regard to the disease tuberculosis itself: The Koch bacillus is by no means the only factor to be dealt with, although it is the essential one. This bacillus has probably had an existence coeval with man. It is much-pervading. The consumptive emits several billions during the twenty-four hours; yet most of us do not evidence

or suffer from tuberculosis. Most of us, indeed, have been its host, but have vanquished the unwelcome guest,—have, in self-preservation, successfully overcome it and destroyed its insidious activity. The whole of tuberculosis is not comprised in this organism; for the disease is the resultant of many factors. Much has been done for the relief of tuberculous patients; but the discovery of the bacillus has *not* primarily influenced treatment. It were irrational in the last degree to deny the usefulness and appropriateness of drugs. In this book the rational use of the pharmacopœia is insisted upon; nor is the evolution of important medicaments from the *Materia Medica* despaired of. Nevertheless it must strike the physician that since Koch's discovery, in 1881, there has not been one essential addition to our list of drugs which would prove directly efficacious against this bacillus or its allied micro-organisms. The anti-microbial remedies which have been given internally with a view to destroying these germs have almost always been worse than useless,—particularly those which have been malodorous and have nauseated; and methods of inhalation, with this end in view, have been quite unscientific procedures.

However, I do not agree with those who hold that the discovery of the Koch bacillus has not fundamentally changed the state of affairs. It has, and on the whole beneficially. For this discovery has led to adoption (or perhaps to the readoption) of such principles of prophylaxis and sanitation as have been found effective against infections generally. The non-drug procedures, although they may have been directed against the bacillus, have nevertheless had their real usefulness in rendering the organism resistant to microbial infection. Our improvement in the treatment of tuberculosis has been in our appreciation and adoption of hygienic measures, not in the use of any special bactericide.

It must, however, be recalled that Bodington and Brehmer and Trudeau had made their influence felt long before Koch's discovery; that such measures as these workers relied upon were directed solely towards the alteration in the tissues by which they should become immune to the operations of the parasite, which had already gained a foothold.

Immunizing and curative sera and methods of vaccination, it is gratefully noted, promise much in the way of rendering the tissues resistant to tubercular infection. It is heartily and most sincerely to be hoped that all expectations entertained for them will be realized. However, in the sum of things it were best to rely upon such immunizing agents as fresh air, sunlight, cleanliness, baths, dry-walled, well-

drained, and well-constructed houses, good food and drink, and a general and widely extended comprehension and understanding of the laws making for health.

To revert to heredity, we emphasize that as functional are more generally transmitted than anatomical modifications, much may and should be done in the way of education and physical training to eradicate vicious metabolism and tissue tendencies. Of course, rapid and immediate results will not be expected. It may here be recalled that the trend of this book is quite in accord with Holmes's suggestion that the proper season for bringing the influence of preventive medicine to bear on an individual is a century before his birth. I think, indeed, that the physician should take a very broad view of tuberculosis,—a view the horizon of which would extend far beyond the incidents which are termed life and death. For this disease is, as has been noted, an index by inversion of human progress; in so far as the former becomes eliminated will the latter advance. Descartes was not altogether right when he declared that if the race is ever to attain perfection it must be by means of the medical sciences. However, if the fundamental principles of cleanliness and sanitation were universally grasped and applied against tuberculosis, the race would, perhaps indirectly, but nevertheless surely, be far advanced in regard to its civilization, and, what is of still more importance, its happiness, its comfort, and its well-being.

Part XV

SOCIOLOGICAL RÉSUMÉ

The situation that has not its Duty, its Ideals, has never yet been occupied by man. Yes, here, in this poor, miserable, hampered, despicable Actual, wherein thou even now standest, here or nowhere is thy Ideal : work it out therefrom ; and working, believe, live, be free.

CARLYLE

When I talked with an ardent missionary and pointed out to him that his creed found no support in my experience, he replied : "It is not so in your experience, but is so in the other world." I answer : "Other world ! There is no other world. God is one and omnipresent ; here or nowhere is the whole fact."

EMERSON

CHAPTER I

UNTOWARD FACTORS

Work out your own salvation.—ST. PAUL.

Most of these (consumptive) children come from Lille, Soubaix, Turcoing, and other manufacturing towns of Northeastern France, where extremes of the most abject poverty or great riches are practically the only existing classes.—*British Medical Journal*, June 11, 1904.

“What we need in society is not charity, but fair play ; and he who attempts to substitute the one for the other handles a sword which deals fatal blows in two directions.”—TARBELL.

CONCERNING the sociological aspects of the tuberculosis situation, I do in this part, which is essentially an expression of personal opinion, lay grateful stress upon two facts.

In the first place, the tendency of civilization is to the good,—more than fifty per cent. to the good. If this were not so, existence must eons ago have become an impossibility. Obviously the tendency of the physical body is in the direction of health and away from disease ; otherwise the maintenance of life were inconceivable. And in like manner all other aspects of existence—the spiritual, the mental, the moral—tend to health. The *wille zum guten* has, as a potency, certainly preponderated over, though of course it has not wholly superseded, the *wille zum leben*, the mere fundamental will-to-live. And it is this will toward the good, this striving after the ideal, upon which civilization does and must base all its hopes.

This fact furnishes the source of the second fact with regard to our subject, that tremendous efforts are making to alleviate suffering and to prevent death. I have in this book taken but a step into a vast, teeming field of endeavor. Most of the work here described—it must be evident to the reader who has come to this page—has been undertaken from motives in the last degree honorable to human nature and tributary to human ideals.

Having thus given grateful and heartfelt testimony to these two facts—I have done so redundantly throughout this book—certain observations appear essential. These are based in the main upon conditions in my own community. Each reader will apply them, as may seem just to him, to the conditions with which he is familiar.

I believe that, taking into account not only the present status, but also the indefinite future, in which after-coming generations will be affected (for such is the philosophy of this book), much that has been and is being done in the name of charity is cruelly futile and worse than useless,—in essence very baneful. I believe also that the work of noble men and women, such as has here been described, is being in great measure rendered a veritable Sisyphus-task by reason of antagonistic social and political factors, overwhelmingly more powerful than the forces which these humanitarians can bring into action.

To him who views the field from a vantage-point sufficiently afar to be comprehensive¹ those in the midst of the work will say: "Here is all this dreadful suffering, this poverty, this anguish of soul, these unnecessary deaths from disease,—what are we to do about it? Don't we have to alleviate it?" And to this great-minded questioning the rejoinder must be: "Where are all these efforts of yours—all this activity—going to end? Much of your splendid altruism, your self-abnegating labor, is useless—pathetically so—for you are not coping with fundamentals; you are but constantly fructifying a deeper and more impenetrable jungle. Your efforts have almost entirely the result to degrade the individual; whereas *absolutely* the only hope in the situation lies in his innate nobility." Let us be specific a little.

This has been called the Golden Age of Charity. There never was a time perhaps when so many millions of money have been expended to the end that poverty and suffering may be alleviated.

New York is the most overcrowded city in the world, and each week brings it thousands of immigrants to increase its already dreadfully surplus population. These immigrants remain because they find the metropolis more attractive than our vast and beautiful country beyond. Many, perhaps most, among these new-comers have means sufficient to last them but for a brief season; and when this is spent they must perforce resort to charity, which is much too freely dispensed. Enough should be given them, with railway fare, by which they may settle in some other region. There can be no hardship for them sufficient to warrant their staying here. This city is not their birthplace; nor are they bound to it by ties of sufficient importance to entitle them to sympathy,—such are too recent to be essentially binding. If they cannot earn a living here, and will not leave, they should be left absolutely to their own devices. It is in the last degree pernicious to be charitable in such cases.

¹ I adopt this view-point in this place though I consider that, having done much medical and other work for more than a decade past in this field, I have acquired an intimate knowledge of the existing conditions.

Again, the reflecting visitor to this most congested of all areas on earth, the lower East Side of New York City, must find it an incongruous condition, to which a parallel is hard to conceive, to pour millions of charitable dollars into this region, by which temporary afflictions are indeed alleviated, but by means of which the manliness of the individuals is subverted. Why, to begin with, has not your magnificent donor paid his workman a decent living wage,¹ with working hours of humane limit, instead of going to the labor-market as one goes to the meat- or shoe-market? Were this to be done in the beginning, there would be no need for charity, and no depreciation of the poor man's integrity. Nor could it in all reason make an essential difference whether the expenditure be originally by just and equable wages or latterly by way of charity.

As we have seen, settlement work has made it possible for too many families to get bread from one quarter, meat from another, clothing from another, comforts from another,—all without price. Surely here is an altogether false state of things, so manifest that comment is superfluous.

Again, day nurseries are provided in which mothers may leave their children while they are at work. Here is a touching charity which certainly appeals to one, and is beyond criticism for a small proportion of cases. But they exist now in great profusion, fostering a dreadfully false condition of life. They have probably, by removing the necessity for parental maintenance, been efficacious more than any other one agency in fostering paternal drunkenness and desertion. They are subversive of the normal family relation in which the business of the wife is not to work away from her home, but to remain within her home, to make it comfortable and wholesome, and herself to rear her children, permitting this privilege to no other arms and hearts than her own.²

Every conceivable phase of sickness is provided for. There are sumptuous lying-in palaces, in which infants begin their charity-eased destinies; there are magnificent hospitals and dispensaries in which medicine and surgery are to be had cheaper than dirt; there are homes and institutions for the convalescent; and when death finally supervenes, there are societies which provide free burial, so that neither heart-broken survivors need be concerned, nor the honorable

¹ "A fair day's wages for a fair day's work."—Carlyle, "Past and Present."

² The report of the New York State Charities Aid Association, issued July, 1905, declares that the number of desertions by fathers increases in direct ratio with the care provided for deserted children by charitable organizations. Another report gives the number of such desertions in New York City alone as 60,000.

souls of the dead have occasion otherwise than to rest unworried and in peace.

In the indiscriminate charity which vitiates so much hospital and dispensary work is to be discerned the trend of things here indicated. While the bodies of many of these patients are being attended to, their *morale* and that of their families is being perverted. And instead of helping the poor by such means as these, there is much too often brought to pass increased wretchedness, increased poverty, increased disease, pauperism finally. Is this statement going too far; is it unwarranted? Let us see; one may easily trace the steps here as elsewhere in charitable enterprise: First, there is the acted lie in visiting the dispensary under false pretences. The perfunctory question is asked by the clerk, "Can you pay a doctor?" The answer is "No,"—easy to make by any one bent on getting something for nothing, for such are the labyrinthine processes of the human mind that one may, if he conclude to cast self-respect to the winds—may, if it serve his purpose—satisfy even himself he is poor, no matter what is the condition of his affairs. The circumstances of the case are not investigated in the manner that charity organization societies investigate the cases of the poor referred to them; not, I believe, in any one instance.

Well, then, the patient having comfortably lied himself into the consultation room, gets treated. He secures what he came for,—something for nothing; free advice and medicine. Here, then, is fostered and stimulated the habit of getting things without effort. Then comes contempt of effort as being unnecessary to procure what is desired; and upon this, lapse into idleness and shiftlessness. There is developed the fatal position that the "poor fellow" is entitled to be taken care of by the well-to-do. Doesn't the world owe him a living? Then must certainly follow, according to natural laws, poverty, consequent misery, discontent, hatred of class, social chaos, anarchy.

Here and there one comes upon instances of obviously untoward tendencies. From one excellent sanatorium for consumptives we learn that of seventy-two inmates only seven were assisted by their families. What have the hearts and hands of these relatives been doing all this time? What has become of their cherished ties, their endearments, their affections, their memories, encompassing the lives of their sick from babyhood up? Has promiscuous charity reduced such sentiments to barren desuetude?

Here a venerable man, whose very presence is an inspiration of nobility, who has seen and striven with much result through many years to curtail such untoward tendencies as these, observes: "Your

criticism of existing conditions is destructive; it is not constructive. Bad as are our methods of doing charity work, do you know any better ways, and if so, what are they in detail? We cannot effect reforms of present evils without clearly demonstrating the methods by which these reforms are to be effected." The answer here, so far as this author is concerned, is that this book throughout has been an insistent appreciation of the present means and methods, which are intrinsically beneficent. I would not, if I could, destroy; but I would restrict, curtail, discriminate, regulate, moderate,—I most certainly would. And first of all and above all, I should do no harm. I should subject these means and methods to eternal scrutiny, as is essential for absolutely every human institution.

To many other phases of modern civilization, more than we can even indicate here, is this tuberculosis situation related. Most of these require expert handling by the specialist. There is the relation of consumption to the vices and crimes of society—"the diseases of society," the "social evil," the occasional brutalities of organized labor, by which distress and poverty are visited upon homes; suffering caused by economic and industrial conflicts, rotten tenements, decline in the working power of the individual, the difficulty of men to get employment, and many others such as we have dwelt upon.

It is pertinent here to state a situation pointed out by Wykoff in his book, "The Workers." Most of the men among whom he lived gave little heed to church-going. He set himself to find the reason of this. He put on what would be the customary Sunday clothes of a workingman—clean, homely, and neat—and in such guise he visited at random fine edifices, some of them "fashionable" churches. He records that he was in absolutely every instance heartily welcomed and most genuinely made to feel at home both by ushers and pew-holders. I think this important to note, for to most human lives religion is absolutely indispensable; and if religion is not to take its part in the alleviation of human suffering the case is indeed pitiable. Nevertheless, Wykoff found that most of the men with whom he worked eschewed religious association. Their general feeling was that there was an impassable gulf between their own lives and the lives of those who maintained these churches. Some reasons for this may perhaps be discerned in the remainder of these pages.

Other results of indiscriminate charity are set forth by Lecky, whose wonderful book, "The Map of Life," is a rare manifestation of comprehensive reflection:

"It is difficult to overrate the evil effects of injudicious charities in discouraging thrift, industry, foresight, and self-respect. They take

many forms ; some of them extremely obvious, while others can only be rightly judged by a careful consideration of remote consequences. There are the idle tourists who break down, in a once unsophisticated district, that sense of self-respect which is one of the most valuable lessons that early education can give, by flinging pence to be scrambled for among the children, or who teach the poor the fatal lesson that mendicancy, or something hardly distinguishable from mendicancy, will bring greater gain than honest and continuous work. There is the impulsive, uninquiring charity that makes the trade of the skilful begging-letter writer a lucrative profession, and makes men and women who are rich, benevolent, and weak, the habitual prey of greedy impostors. There is the old-established charity for ministering to simple poverty which draws to its centre all the pauperism of the neighboring districts, depresses wages, and impoverishes the very district or class it was intended to benefit. There are charities which not only largely diminish the sufferings that are the natural consequence and punishment of vice, but even make the lot of the criminal and vicious a better one than that of the hard-working poor. There are overlapping charities dealing with the same department, but kept up with lavish waste through the rivalry of different religious denominations, or in the interests of the officials connected with them ; belated or superannuated charities formed to deal with circumstances or sufferings that have in a large degree passed away,—useless, or almost useless, charities established to carry out some silly fad or to gratify some silly vanity ; sectarian charities intended to further ends which, in the eyes of all but the members of one sect, are not only useless but mischievous ; charities that encourage thriftless marriages, or make it easy for men to neglect obvious duties, or keep a semi-pauper population stationary in employments and on a soil where they can never prosper, or in other ways handicap, impede, or divert the natural and healthy course of industry. Illustrations of all these evils will occur to every careful student of the subject. Unintelligent, thoughtless, purely impulsive charity, and charity which is inspired by some other motive than a real desire to relieve suffering, will constantly go wrong, but every intelligent man can find without difficulty vast fields on which the largest generosity may be expended with abundant fruit."

One anxious to be helpful to others must then reflect that it is possible for his well-intended philanthropy to prove in the end even more disastrous than the condition in which things would have remained had he not acted. But with regard to our subject there are several paths, such as we have set forth, upon which one may tread

without going very far wrong. One is education, not the sort by means of which everybody is to become cultured and *dilettante*, with no one left who can wash dishes and make beds, but the knowledge of sober, sturdy literature, such as sweetens the soul and stimulates to a comprehension of things essential to decent living. Especially should be inculcated a knowledge of the sciences which have been so nobly instrumental in making existence enjoyable and wholesome; which have done so much to eliminate from life causeless, unnecessary suffering.

Next, the providing of sanitary dwellings, upon small and just rentals, in which the poor man and his family may live in dignity and in sobriety. And then the poor fellow who is exhausted in body and soul; who has tried hard over and over again; who, like the pugilist, bounding up with strength enough, after the first blow, but who, after countless blows have been rained upon him, cannot, however willing his spirit, revive through the ten seconds which the game allots him sufficiently to meet the next blow,—here surely is one to be helped, to have his strength renewed, to be set on his feet, to resume the fight of life with a few of the chances, at least, again in his favor.

There should certainly be some system approximating the German method of workmen's insurance against sickness and invalidity. To this, as we have seen, the workman himself contributes, so that the stigma of living upon charity is not his to endure. We have been able to discern among our own workmen's associations some efforts making to this end. It were well if these associations, declining outside contributions, should establish many sanatoria and health farms where their stricken members could recover their strength and health.

I discern with gratification that indiscriminate charity and other enervating factors have not altogether dissipated the integrity of the individual,—absolutely the one and only force upon which civilization can be based. If the human unit be deteriorated, it were vain indeed to expect alleviation of untoward conditions. I therefore, as one exultant for humanity, quote from an article on "The Help that Harms," in which Bishop Potter has detailed his experiences several years ago in the Stanton Street Pro-Cathedral. He devoted a vacation to work in this lower East Side region,—

"I gave six hours every day to receiving anybody and everybody who came to me. During that time I had visits from dilapidated gentlemen from Albany and Jersey City and Philadelphia and the like, who supposed that I was a credulous fool whose money and himself would soon be parted, and who gave me what they considered many excellent reasons for presenting them with five dollars

apiece. But, during that whole period, not one of the many thousands who lived in the crowded tenements all around me, and to hundreds of whom I preached three times a week, asked me for a penny—not one! They came to me by day and by night, men and women, boys and girls, for counsel, courage, sympathy, admonition, reproof, guidance, and such light as I could give them, but never, one of them, for money. They are my friends to-day, and they know that I am theirs; and, little as that may mean to the weakest and the worst of them, I believe that in the case of any man or woman who tries to understand and hearten his fellow, it counts for a thousand-fold more than doles, or bread, or institutional relief.”

Those connected with medical institutions have frequent occasion to note the reluctance among poor people to accept relief which is offered; there is still to be found a genuine dread of “going on charity.” Mr. Poole has told us how many will not go to dispensaries and hospitals until their consumption is far past relief; until, indeed, the partaking of charity is all that is left between life and death. Surely this is a most pitiable state of things; yet in it there is saving grace, for here is displayed the noble dignity of the individual spirit upon which the very life of the race depends.

The corrupt politics of the day—brutally, lawlessly, almost hopelessly corrupt—furnish a gigantic factor making against the humane efforts of good men and women. The fundamental reason of this corruption lies in the flaccid temperament of the single citizen. The government is his, he makes it, he deserves it as it is. The officials are in their places, and act as they do either by the citizen’s ballot or by his disregard of the duty to vote.

Private enterprise has to do a very great deal which our lawmakers and our official executives are well paid to do. We get somehow excellent tenement house laws passed. Then it is a matter of eternal vigilance to guard them against the encroachments of people as mean as ever disgraced civilization. Laws against child labor are obtained with extreme difficulty, which is merely preliminary to the business of getting them enforced. Factory inspectors have constantly to be kept to their work. Suitable State institutions, in which consumptives may be treated, to the end that the community may be safeguarded from infection, can be had established only by stupendous labor, and then sometimes this labor is rendered *nil* by means truly disgraceful to the body politic.

One feature of the federal government must here be emphasized. It is the national tariff, unquestionably a very grave falsification of the spirit of justice to all men, and of equal political rights, upon which

our fathers founded this government. Lest this stricture seem fanciful, I quote an Englishman, Sir Douglas Powell :

“The prevention of consumption involves a much wider issue than the circumvention of the bacillus. The abolition of the corn duties and other Free Trade legislation and improved rates of wages have done more to diminish the death-rate from consumption than any notification law against the disease would have been likely to have effected.”¹

Dr. Bulstrode, of London, corresponded concerning the increase of tuberculosis with Mr. T. J. Stafford, Medical Commissioner of the Local Government Board for Ireland, who answered: “I am very interested to ascertain approximately to what extent tuberculous disease depends upon (a) infection; (b) density of population; (c) general unsanitary conditions; (d) climatic influences; (e) economic causes. Without in any way desiring to cast a doubt upon the important influences of infection as a means of distributing the disease, I fear we may possibly lose sight of the more responsible factor which is at the bottom of the question. I refer to economic causes. I am inclined to look upon all the others I have mentioned merely as the agents acting upon a population which from economic causes is unable to resist the disease. Whilst I do not for a moment suggest that we should not vigorously attack these agents and do great good by so doing, if we desire to get down to the bed-rock we must deal with the question upon an economic basis. I am at present engaged in some researches, somewhat on the lines of Mr. Rountree’s York experiment, with a view to ascertaining how the working classes of Dublin live. I do not wish to anticipate the result of these investigations, but I believe they will show a general condition of deplorable poverty and an unduly large proportion of underfed, badly clothed, and generally ill-nourished men, women, and children, endeavoring to live under conditions which, to say the least of it, are not conducive to longevity. The result in Dublin is a very high death-rate and an exceptionally high rate of mortality from tuberculosis. Throughout this country the steady outflow of the healthiest among the male and female population does not tend to improve the physical condition of the race, as in addition to drawing away the fittest and depriving the country of their labor we have left at home to keep up the stock what are, comparatively speaking, the weaklings. We have, therefore, in ad-

¹ By the simple expedient of Free Trade he (Peel) had given the people bread, putting, as Mr. Bright said long afterwards, the Lord’s Prayer into an act of Parliament. (Herbert Paul’s “History of Modern England.”)

dition to ordinary public health administrative measures, if we wish to deal effectively with tuberculosis, to face grave economic problems.”

This is no place for the consideration of a tariff framed by a party of moral ideas for the protection of domestic industries. However, I am confident the following statements are impossible of refutation; they are *à propos*:

The idea of a government protecting its industries connotes a pleasant, comfortable, paternal state of things. But no government can be kindly and paternal except with the money of its people.

It is the citizen of the country which levies the tariff, and not the foreigner, who pays the tariff tax.

The present protective tariff of these United States requires that one must oftentimes pay for an article produced in this country as much as sixty-five per cent. more than the foreigner has to pay for that same article, although the producer has paid, in addition to the cost of manufacture, the freightage upon it into the foreign country.

It is impossible to frame a tariff which will be even measurably equable and which in its levies shall not unjustly tax many citizens, and in reciprocal degree enrich others; and since practically all the necessities of life are on our tariff list, the revenues are finally derived from the poor, who are in the vast majority. It is the self-respecting poor who have to pay a great deal more for their necessities than they would have to pay if there were no tariff.¹

There is probably in all history or literature no statement more meretricious, more preposterous, or (to the American) more humiliating than that the industries of these United States need to be protected.

Together with the tariff there are other politico-sociological factors which are inductive of privation, resulting in much unnecessary sickness and death. The nature of these is demonstrated by means of the ordinary channels of information open to every citizen. Neglect or condone them as he may, it is impossible of belief that he has not competent knowledge concerning them.

There is a dangerous disregard of the country's laws and of equitable

¹ M. Yves Guyot is convinced that not five per cent. of the French people reap any advantage from their protective tariff, while all the rest pay tribute under it. He points out the “unseen” taxes which this protective system levies. On bread and meat alone he estimates this tax in France to be as much as forty million dollars a year,—similarly with most of the other necessities of life. “In a country whose fiscal policy compels the people to pay a heavy toll on their daily bread, it is not strange that there should be reluctance to increase the number of mouths to be fed.”—*New York Evening Post*.

sense such as makes it possible, for instance, for a single individual to control more than half the meat output of this country; which makes it possible for the organization which this one human unit controls to slaughter and prepare cattle for market in ways most repulsive and unsanitary, and by methods which evidence that practically no consideration is entertained other than for the money which is to be made.¹

It is very true, and no man can aver the contrary, that in the business and finance of this country, he who would act in obedience to just and wholesome dictates is like to have his business life crushed out and his business career, such as should be the ambition of good men, most ruthlessly destroyed. It has become a dreadfully persuasive opinion, founded upon very common experience, that such a career, conducted in such a way, has become a practical impossibility,—that honesty cannot be made to pay; and this state of things is to a calamitous degree becoming subversive of normal trade standards.

And it is known of all men, and worthy the particular reflection of the straight voter—the man true to his party, to whom it never occurs to be true rather to his country, the “easy mark,” the bulwark of rotten politics, the man upon whom the party bosses rely with supremest confidence, born of many safe experiences—that this subversion of business morality, so fatal to wholesome ideals and so degrading to the national character, has been in essential measure fostered by the connivance of men voted for and appointed to frame and execute our laws. It is true, and all men know it, that a hopelessly large proportion among these politicians are so bounden to vast aggregations of wealth that it is impossible for them to serve their country in accordance with their oaths of office.

Wherefore, these and many like considerations make it manifest that a condition of things has come to pass which dooms millions of our race to grunt and sweat under a weary life, often in dreadful suffering and disease, in order that a very small and comparatively contemptible minority may amass possessions vastly in excess of their capabilities for enjoying them.

Finally they are true to-day, these words of Jefferson, nor dare any man deny them:

“If once the people become inattentive to the public affairs, you and I, and Congress, and Assemblies, Judges and Governors, shall all become wolves. It seems to be the law of our general nature, in spite of the individual exceptions, and experience declares that man is the

¹“Is Chicago Meat Clean?”—*Collier's Weekly*.

only animal which devours his own kind ; for I can apply no milder terms to the governments of Europe, and to the general prey of the rich on the poor."

And do what we will, say what we will, continue, reach out where we will, we shall always have to conclude that absolutely the only hope in the situation with which this book is concerned lies in the integrity of the human unit. The health of the human body depends upon the stamina of its cellular elements. In like manner every aggregation, every community, every nation, every people, must be tested by the calibre of its component individuals.

CHAPTER II

PHTHISIOPHOBIA

Gegen Dummheit kämpfen die Götter vergebens.—SCHILLER.

THE reader must now be impressed with the fact that the fear of phthisis, which exists to a deplorable degree and is the cause of so much undignified conduct and such inhumanity towards the consumptive, has little reason for existence. We know the methods of infection, principally from human sputum, not so often by way of ingestion, and very occasionally by inoculation; and that, unlike the contagious diseases, the contact must be frequent, repeated, and long continued, if consumption is to be communicated. Terrors of all sorts are invariably dissipated immediately knowledge and understanding are arrayed against them; and with the comprehension of these facts concerning consumption, one must lose his fear of the disease, and may with equanimity return to reasonable, grown-up behavior.

It is really deplorable to consider the degree of cruelty and selfishness to which this phthiophobia has driven people. Consumptives must perforce give up light work, such as they are sadly in need of. Employers will not engage such men; they are not going to run the risk of catching the disease,—not they. Here a clerk suspected of phthisis is discharged; there a woman loses her place because it is whispered “there is consumption in her family.” Even our powerful government at Washington—powerful enough to be merciful—sees to it that its phthiical employees shall be dismissed without pension. The work of the postman, so innocuous and so suitable for many cases of incipient phthisis, has cruelly been denied to such sufferers. The Treasury authorities and the Commissioner of Immigration, despite the protests of eminent physicians, have decided tuberculosis to be a contagious disease, and have ruled that entrance of such alien sufferers into these United States be prohibited.

A Pennsylvania town makes the imbecile regulation that barbers shall not shave consumptives. A Western city is reported to have passed an ordinance making it an offence punishable by fine or imprisonment for any one to erect a sanatorium within the city limits. Disregarding for a moment the inherent inhumanity of this procedure,

one must note that while this ordinance continues on the statute books consumptives are scattered over the entire community, in hotels, boarding- and lodging-houses, private houses, tenements, hovels, propagating the disease and knowing not how or taking no care whatever to act against the spread of the infection.

Only the other day injunction was sought, by an individual in whose cosmos there was an absurd preponderance of the Ego, against the Health Department, which sought to establish a tuberculosis dispensary for the poor of Brooklyn. Similar examples are come upon from time to time in the press. An incongruous situation is here emphasized in the fact that in Manhattan borough there is a reception hospital for cases of scarlet fever,—a disease much more infectious than consumption. It is on Fourteenth Street, adjacent to the most crowded region in the whole world, yet no one fears its proximity, nor has any one reason to.

I have mentioned Flick's fight in Philadelphia. Bulstrode writes that in an English town where a sanatorium for the relatively poor has been inaugurated by the energy and philanthropy of a medical lady of eminence, the rector of the parish forbade his curate to visit at this institution because, as he declared, the disease is as dangerous as smallpox. When passing the sanatorium this precious smircher of his uniform crosses to the other side of the road. "It remains for the future to decide whether the rector or the patients shall be furnished with the leper's rattle with which the arrival of one or another may be duly notified."

Some years ago a young woman left New York City for the West. She was of splendid intellectual capacity, amiable, gentlewomanly, and withal of an exquisitely sensitive nature. She had little means; and, in order to travel as cheaply as possible, she took a slow train, let us say, on a Monday evening. She reached her destination late on Wednesday afternoon, very much exhausted and very ill. Although almost six feet tall, she weighed, before going, just ninety-seven pounds. She had the lustrous eyes and the pink flush associated with consumption. Her pale face was suffused with a cold perspiration, and she had the cruel cough which wracked her chest and would not let her rest. The first thing she did was to go to a home for young women, where she asked to remain overnight, so that in the morning she could go to the sanatorium where her stay had been arranged for. They would not take her in. It was their rule to refuse consumptives, even for a night; and with the name of the "Poor Nazarene" over their door, they turned her away.

The reader must now see that there was no occasion for this. We

might dilate upon the spirit of Christliness to which this institution would ostensibly lay claim, and through which spirit this very sick traveller might surely have been given shelter until the morning, at least. But, upon a purely practical basis, there is no reason why, with elementary knowledge and common sense, such as those controlling such an institution should have, this sick one could not have been provided for without in the least jeopardizing the health of any other person. The progress of civilization is never furthered, indeed it is most horribly retarded, whenever the stigma of inhumanity is fixed upon the fair countenance of religion.

CHAPTER III

CONSUMPTION AND CHRISTIANITY

The gods and goddesses were feasting and loving on Mount Olympus, when into their midst there staggered a pale Jew, with a crown of thorns.—HEINE.

It is the spirit of Christ which has been the supremest influence in shaping civilization during twenty centuries past,—a spirit which has on the whole prevailed over all else that has been antagonistic to it. It has endured and never has been more potent than to-day, despite the amazing obstructions that have been and are put in its way,—the activities of its detractors, the obscurative and preposterous reasonings of metaphysicians within the very church founded upon this spirit, the manifold wickednesses of its mediæval priesthood, the ghastly hypocrisies among many of its clergy and its professors from the beginning through to the present time, and the dissensions among the multitudinous sects within this church.¹ Notwithstanding inquisitions, tortures, burnings, wars of religion,—more bitter, bloodier, and more hellish than those from any other cause,—the benignant Christ-spirit has remained vital and dominant, and will continue to be so, let us reverently hope, through many centuries hence.

What reason need one seek why this spirit endures beyond such as is revealed in the gospel of this Christ? Here are set forth, for an adequate inspiration, His life, His exposition in parables of natural laws and fundamental principles, which are universal in their scope, and which, no matter what we will, control us and all other beings and things; His enunciation of the very best ethical guide for the conduct of life which the world has ever known; His insistence upon the renunciation of pleasure and of possessions as a *summum bonum*; His merciful mission; His intrinsically simple, lofty, lovable character,—the idealization of the gentle-man; His noble altruism; His tender sympathy for men and women who suffer and are in anguish; His self-abnegation, even to the death; His supreme sacrifice, and the infinite pathos of the hours preceding its consummation. It is none

¹The story is told of an unbeliever who visited Rome in the time of the Borgias. He embraced Christianity, declaring that a religion which could endure, despite so much wickedness done in its name, was one in which his faith would rest secure.

other than such influences as these that have so thoroughly saturated the natures and the souls of mankind since His advent. And unquestionably, among all these influences, most potent is that expressed in the invitation to the sick and the afflicted, which wells up from His great all-enveloping brother-heart: "Come unto me, all ye that are weary and are heavy laden, and I will give you rest."

To the good fruit which this spirit has borne every man who lives in the world and is of the world must give grateful testimony. Such testimony is most insufficiently described in this book. However, some instances to the contrary have been set forth, and to these must be added the following:

There is the "Goodsell-Bedell" bill, which for years made it impossible to establish a sanatorium for consumptives anywhere within New York State.¹

Here I would wish, for my part, not to be misunderstood. For example (and my supposition is purely imaginary, for I know of no such case), it would be neither wise nor right to seek to place a sanatorium or a dispensary for consumptives among a block of sumptuous dwellings in a city. It would not be right both in behalf of the rich resident and of the poor consumptive. For the former is every whit as much entitled to have his rights conserved and his sentiments considered as is the poor man (and it is, perhaps, superfluous to add that he usually has but little trouble in this regard). But especially in behalf of the poor patient it were not well to put such a dispensary or sanatorium in such a place. An example to this effect, indicating a status which I cannot but consider unfortunate, is that of a general hospital which has been erected upon perhaps the most fashionable thoroughfare in New York City, among residences whose owners are said to have fortunes aggregating very many millions of dollars. This hospital is magnificent and palatial in its appointments—no other terms are adequate. Concerning it the lugubrious plaint has been made that here the poor receive treatment and care such as an ordinary millionaire cannot afford. Surely the effect of all this upon many a poor patient's psychism must prove disastrous; is it not likely that much subsequent bitterness and dissatisfaction with life are

¹ "It was one of the most disastrous measures which have received legislative and executive sanction." The effect of this law, continues the report (of the State Charities Aid Association, for the year ending Nov. 1, 1903), is to make it impossible for any city in the State, or any fraternal order, charitable society, or philanthropic individual, to establish a hospital or similar institution for consumptives outside the city limits, except under practically prohibitive conditions. —*New York Times*.

thus bred? A sense of proportion is, in fact, absolutely essential in this matter; and this, I humbly submit, the Master himself indicated in His teachings. ("Give unto Cæsar," etc.) Institutions intended for the poor should be placed in the districts where the poor live—except there be peculiar and special reasons to the contrary.

And there *are* peculiar and special reasons inherent in the sanatorium idea, which are, however, distinctly combated and defeated by this Goodsell-Bedell bill. The fresh air and the sunshine of the country are essential for the consumptive, which have been denied him by the terms of this brutal measure.

As I understand it, the prime instigator of this law was a man of colossal wealth—amassed God knows how—who owns a park of some twenty thousand acres in New York State. These preserves are so vast that one might wander about them from early morning until evening without coming upon another creature who could answer him in speech. It so happened that the health authorities of New York City, seeking some means to alleviate the appalling suffering and loss of life among its citizens from consumption, found a healthful spot appropriate for a sanatorium, in which a few among these many thousand wretchedly sick might find some rest and relief. But it also happened that this proposed sanatorium would be erected some miles distant from the preserves here mentioned.

It does not appear that this man has ever manifested a spirit other than one essentially ego-centric. Therefore it were useless to approach this incident from any other view-point. If, perchance, he were minded to use his inordinate wealth in this domain in a fashion to deserve the congratulations of æsthetic and cultivated temperaments, his desire would not in the least have been interfered with by the erection of this sanatorium. For, though it would not have been magnificent, this structure would have been graceful and in harmony with its environment; nor would any of its inmates have been permitted beyond its gates and fences; nor is it likely that any one among all these sick would ever have offended even the eye of this precious "magnate." Let this be distinctly understood. His "property rights" would not have been encroached upon.

From the view-point of practical economics and of wholesome public policy, such an institution as this in such a position was manifestly essential in order that the infection might not spread among many thousands in the civic communities; and, as we have seen by the example of other regions in which sanatoria have been placed, both the material prosperity and the actual sanitary conditions of this region would have been enhanced. Yet, by means of the passage of

this bill, did a local coterie¹ (one of whom was the Governor), having the Legislature of this Empire State "in the hollow of the hand," frustrate the efforts of the Department referred to, thus withholding life from many thousands of its people and jeopardizing the health of the remainder of its urban populations. I recall no instance analogous to this product of American politics. Can the reader find in history one exceeding it in prostitution of the law to personal whims, or one to equal it, indeed, considering the assumptions of political superiority, of an uncajolable electorate, and all the rest of it, which are so blatantly made by the American citizen?

Again. Samuel Hopkins Adams² finds that the owners of bad tenements in many cities, "both by maintaining evil conditions and by opposing or disregarding the tenement laws, are the responsible allies of the great white plague."

"Who are these allies? Let us take up New York City first. Going back a few years we find, as the most active and successful enemy of tenement reform, a great sectarian body,—the Trinity Church corporation. In defence of this corporation it is claimed that there has been a change in its policy, and that its tenement property is now in decent condition and reputedly administered. This may be true in general; in certain cases it is not. Whatever the present conditions may be, within fifteen years the old board was the leader of the fight in behalf of "the sacred rights of property" against sanitary reform, and the evil that it did lives after it in influence and in encouragement to the (non-religious) bodies which are now carrying on the war. The Trinity Church corporation (it has always insisted on being regarded as distinct from Trinity Church, of which it is the week-day manifestation and "wicked partner") possessed whole rows of tenements, mostly in the lower West Side, in which the sanitary and moral conditions were about on a par, as is so generally the case. Not only were the death-rate and tuberculous-rate very high, but some of the worst saloons in the district were maintained there, and there were conducted also houses of ill-fame which radiated moral and physical contagion. In the course of time public opinion was aroused against the corporation—not that its tenements were worse than the worst, but because of its church connections—and appeal was made to the law. With all the force of its great wealth, its religious authority, and its tremendous social prestige, the body fought and fought so valiantly that to-day the Trinity Church corporation

¹ Harriman, Odell, Goodsell, and Bedell are all residents of Orange County.

² McClure's, January, 1905, Tuberculosis; the Real Race-Suicide.

suits are stock citations in legal practice. Although finally compelled to a more decent standard, the corporation succeeded in obtaining decisions which have considerably crippled every subsequent attempt at tenement reform."

Mr. Adams continues to narrate how there are now a number of "vulgar persons" owning individual tenements who have banded together in the United Real Estate Owners' Association, which is in some respects the heir of the old Trinity Church Corporation. This association continues the fight against tenement reform and is a most virulent factor in legislation at Albany.

In Chicago there are much the same conditions flourishing upon prejudice and greed, in which many among its best citizens and such as are of guaranteed saintliness are sharers. Here is an institution for the inculcation of morals and learning, maintained the whole world knows how, concerning which the grewsome pleasantry is but too true,—that this university is in all respects well equipped, providing as it does not only the means for the scientific investigation of disease, but also the human material upon which to base such study. Consider again from Mr. Adams: "Well, the University of Chicago doesn't need to purchase foul tenements. It owns them now. Early in my investigations I came upon them. There are a number of them on Blue Island Avenue, Forquer Street, and other slum regions on the south side. To the passer-by they are distinguishable by being a little more out of repair than their neighbors. A few are so bad that even the hardened tenement dwellers shun them, and in those teeming thoroughfares they stand silent and unpeopled. The average Chicago University tenement may not be the worst in the city, but it is sufficiently bad to furnish plenty of tuberculosis subjects for the Rockefeller fund experiments. Nor is there bright prospect of improvement. For the University of Chicago operates its own tenements, and it is not what would be called a good agent. Its replies to repeated appeals for repairs and better sanitation constitute an interesting study in the science of evasion and non-commitment. Very possibly Mr. Rockefeller knows nothing of the tenement branch of Chicago University; but members of the faculty with whom I have talked know of it and are not proud of it."

In Boston there is this Gilbertian topsy-turveyism, compelling a smile despite every repressive effort, such as one should make in this decorous atmosphere: A physician prominent in the anti-tuberculosis movement called the attention of the authorities to a row of tenements in very bad condition, whence had been reported a number of cases of consumption. The Board of Health proceeded against the

owners, and the physician was the principal witness. To his surprise he found that the tenements were owned by a syndicate of Back Bay people, several of whom were his personal friends, and most of whom were socially and religiously prominent, and members of a famous reform organization which was even then criticising the city authorities for alleged laxity in compelling obedience to the tenement laws. Some time ago a number of buildings were called to the attention of the Board of Health, which sent out notice that certain repairs must be made. On looking up the record the board was surprised to find them owned by a co-operative building organization made up of reform, philanthropic, and settlement people which does, for the most part, very excellent work in the slum districts. A woman stockholder in the organization came to make an appeal to the officials.

"You know we're a charitable organization," was the basis of her plea.

"Doesn't your stock pay dividends?" asked the official in charge.

"Oh, yes," was the reply.

"How much?"

"Five per cent. last year; but if it doesn't pay more this year, I shall think there's something queer about it."

To the lady's chagrin the authorities insisted on the repairs being made.

The reader will agree, in passing, that in this volume there is entire accord with Mr. Adams's observation,—“I do not wish to imply that an organization which strives to produce improved tenement conditions ought not to pay dividends. The Octavia Hill Association does this in Philadelphia,—does it well and profitably. But it asks no immunity from anybody; there is no need of it. Its object lesson, that good tenements, with plenty of air and light and decent sanitation, can be made to pay four per cent., is perhaps as valuable an educational influence as the unhopeful condition there has produced.”

It is worthy of note with regard to these peculiarly sanctified business enterprises which Mr. Adams details, that in New York and Boston, at least, they were in thriving condition long before those dreadful, wicked men, Darwin, Huxley, and the rest, knocked from under a lot of theological props and destroyed the foundations of orthodoxy and right living.

CHAPTER IV

CONCLUSION

What if earth be but the shadow of heaven, and things therein each to other like more than on earth is thought.—MILTON.

ONE of my haunts is a very high cliff overlooking a majestic river. There is here an arm-chair which nature has considerably cut out of the rock, in the interstices of which some wild flowers and blades of grass have managed to manifest their claims to sustenance and moisture and the sun's rays. I have for hours been in this seat with no other occupation—is there a better?—than to absorb something of the elemental beauty and grandeur which the Omnipotent has here so lavishly dispensed. Several hundred feet below, one mellow autumn afternoon, there came up from the shore the voices of boys playing at ball—healthy, lusty young fellows—and from that distance their shouts made delightful music. Upon the river were rowers whose boats looked like toys; men sailing; from time to time stately white palaces proceeding with epic movement upstream; and, pleasantest of all, excursion barges upon which working folk upon a holiday were laughing and dancing. Across the river was an estuary penetrating a rural panorama until it met another splendid body of white-capped, craft-dotted water. Beyond this again there were green fields and rolling country. And then, many miles away, up to the horizon, was the ocean, upon which well-filled sails blended with the cumuli in the blue above.

The land across the river, up and down, was beautifully undulating,—roads winding here and there through fields and wooded lands; pasturing kine; farm-houses comfortably ensconced among noble trees; and up from the south there came a breeze wonderfully soft, odorous, caressing, ingratiating to the senses, which moved the foliage about me to rustle contentedly. Here was peace,—universal, kindly, ineffable; even to suggest a jarring note were sacrilege. Here one might comprehend the poet's meaning, that nature is the garment which God puts on in order to manifest Himself to His creatures; here one might reach some comprehension of the *Weltgeist*; here, indeed, one might hope to become permeated with the Universal Spirit and might come to wonder how that beneficent, heart-resting influence ever loses its hold upon human kind.

The afternoon wore away and presently the sunset cast its ever-lengthening shadows. And then came the note most affecting in all this satisfying atmosphere. Whom has it not touched that has ever contemplated it,—the home-lights appearing one by one as the waning twilight merges in the evening and the night? Good, kindly folk, harming no one; depriving no one of his own,—for what need amidst such superbountiful provision of everything essential for comfort and well-being; resting from their wholesome labors; soberly contented; happy in their family loves and relations; thankful in their prayers, above all, to have been vouchsafed another day of life,—of life so sweet, so wholesome, so rich in blessings, so good to enjoy; of life, among all things conceivable, infinitely the most precious.

And so I walked under the stars away from this handiwork of the Almighty, back to the city built of men.

This whole world of ours is beautiful, comfortable, and complete for the needs of all creatures after the manner here so inadequately set forth. To dwell here only upon my own land, which is one vast and constant reduplication of such scenes: Consider,—our country lies between two mighty oceans. Wherefore, so long as it remains united the distractions attending armaments, and warfare, and the military service should not require consideration. It is within latitudes most congenial and favorable to human life. There are within our borders natural riches redundantly enough for all to enjoy. The earth teems with nutriment far beyond the needs and capacities of her children,—the grains, the fruits, the meats to nourish and sustain; the means for warmth, for the ornamentation of the person, the decoration of the home. Every conceivable thing essential to existence,—nay, every luxury that can be desired is superabundantly at hand. How worse than wicked, then, how stupid is it, what veritable insanity indeed, requiring the attention rather of the alienist than of the judge, that moves men to deprive and withhold from one another the wholesome joys of life,—even the merest essentials to existence! Yet such are the conditions of our civilization that among our people to-day at least ten millions¹ are in the direst poverty and suffering, of whom hundreds of thousands must die untimely for want of the health, strength, and sunshine, and the air of heaven which has been provided with such infinite bounty.

The government of this our country is founded upon perhaps the noblest political ideals in human history. Here the people, it was intended, should govern themselves. Their welfare and their development should be of their own making. Those entrusted with the

¹ Robert Hunter.

machinery of government should be in authority for stated brief periods and should be so placed by the popular appointment. Here every man should be free to work out unmolested his own salvation. It is such ideals as these, established by our great-spirited fathers, that are the basis of all that is best in our government and our civilization; and our present grave danger lies in their neglect and subversion.

Many millions have emigrated to these shores from the Old World, having learned of the generous gifts which nature has here poured forth. More than this, they have believed that here freedom is to be attained, with a proper enjoyment of life and the unmolested ordering by each man of his own well-being and development. Many among them have hoped (the dream was too iridescent for all to have indulged in) that here they need no longer fear statecraft, or kingcraft, or priestcraft, or the unwilling service of arms, or the repetition of such misfortunes as crowd the pages of the Old-World history,—its poverties, its pauperisms, its plagues and pestilences, its unnecessary deaths, its agonies, despairs, soul-exhaustions, its pitiful hysterias, the choking of its ideals, its stagnations, its un-Christlike class gradations, the arrogances and greeds among its rich, the cruelties of its powerful men, the diableries of its nobility, its bloody and occasionless wars. All this was to be left behind. The race was to begin afresh. Why not? Had it not here its destinies in its own hands? They came, and are coming now, these immigrants, many thousands every week, and have found, with regard to nature's gifts at least, a realization far exceeding their extremest hopes. Nevertheless, in quite the same old blind, stupid, fatuous way are the conditions left behind being permitted redevelopment. It is only names that are being changed.

There are here statecraft and kingcraft again in fullest measure, but under other nomenclature. Many among those elevated to authority by the votes of those presumed to be their political equals manifest all the vices of the old systems, yet lack in much greater degree such fine and noble instincts as have oftentimes characterized Old-World potentates, especially the solicitude for the afflicted which characterizes the ingrained aristocrat. And here, quite in the old way, many among those sworn to maintain the rights of the people in justice and in truth are bound by corrupt pledges to the end that an unscrupulous and powerful and cynical few may continuously "support and enrich themselves by procuring the degradation and suffering" of their fellows.

And then, again, in quite the same Old-World fashion—though not nearly to the same extent, thank God!—do these ruthless and lawless elements subsidize to their purposes certain among those whose

ostensible business it is to preach the simple faith of the Carpenter's Son. In the old days it was,—

Das Eiapoppeia vom Himmel,
Mit welchem man einschläfert, wenn es greint,
Das Volk, des grossen Lümmel.

So here and now—but not so often, I repeat, for the thing cannot so much get itself believed—does the Reverend Mr. Honeyman, in unctuous cadence, his finger tips atouch, exhort the poor (Christ's poor), the sick, and those with sense of resistance quite crushed out, with vitality quite bludgeoned out:¹

True, they are wretched; they have been wronged; they must work until they rot; for them there are no flowers, nor sweets, nor the song of birds; to them even the freest of all benefactions, the air of heaven and the comfortable sunbeams, are denied; to them existence is one endless misery. Wait, however; they are evilly entreated here. In this life they must be faithful to that station to which they have been called. But let them think of that which is beyond. Another and a beatific environment awaits them, if they but meekly and contritely bear the burdens which now for an inscrutable purpose are laid upon them. (I wonder does the Reverend Mr. Honeyman for a moment believe this which he preaches; or does either he, or Dives, whose pander he is, ever reflect upon its theological alternative? Would either the one or the other have courage for introspection upon such basis? I think not.)

And here lies the crux of the whole situation. I shall not in these pages—it is not essential—discuss the dogma of the future life. I, for my part, humbly and with prayer hope for it; and I have my dead, whom I would see again. But my longings and my creed are here no more relevant than another's. Our business is to see to it that our sick and wretched brethren shall not be cajoled into a dull endurance of their present sufferings upon such basis. We have here to stand upon but one fact, the truest fact that can be conceived, the one absolutely unassailable actuality,—the life which I and you and he are *now* living. Nothing shall subvert the sentient being's right to health and strength and happiness here and upon this earth. No one knows of any state more precious; there *is* none more precious than this life, to be developed to the full in all its God-bestowed aspects,—the infant cementing the affection of its parents; the school-child sweetening the home; the adolescent boy and girl

¹ A type is characterized. The reader will find neither here nor anywhere else in this book an animadversion upon the priesthood as a calling.

opposing their inexperienced idealisms to the meannesses of life, its grotesqueries. and its ghastly compromises; the youth and the maiden joining their hearts in wedlock; the husband maintaining his family; the wife rearing her offspring; the mature man prepared to accomplish with right doing the world's work; the venerable counsellor; "the justified mother of men," who sits on her porch surrounded by her children and her children's children, while the rays of the setting sun touch warmly her whitened hair.

Here one shrugs his shoulder: "Yes, all this is true and very dreadful which you state. But then we must take conditions as we find them," or "men have got to get along some way," or "business is one thing and sentiment another," or "there is no use in trying to make the ways of the world conform to abstract theories," or many like expressions. "And then," continues the practical man, "what are you going to do about it? Besides, consider the compensations for these things in our civilization, consider its achievements."

Very well, then. Is it really of so great essence that men shall forever with turmoil and wrong-doing, with much anguish, and sweat, and dying contrive and build mighty works, tremendous enterprises, magnificent structures scraping the skies, giant cities, vast memorials of material striving, so often miscalled human progress? Have you read Shelley,—

I met a traveller from an antique land
 Who said: "Two vast and trunkless legs of stone
 Stand in the desert. Near them on the sand,
 Half sunk, a shattered visage lies, whose frown
 And wrinkled lip and sneer of cold command,
 Tell that its sculptor well those passions read
 Which yet survive, stamped on these lifeless things,
 The hand that mocked them and the heart that fed,
 And on the pedestal these words appear,
 My name is Ozymandias, king of kings,
 Look on my works, ye mighty, and despair.
 Nothing beside remains. Round the decay
 Of that colossal wreck, boundless and bare,
 The lone and level sands stretch far away."

And have you ever thought to put all such "progress" in the balance against Gethsemane? It is naught, it is all naught, I tell you; it is worse than naught, when set against the single cry of a soul anguished for its kind. And is it not woful, O Christ, is it not infinitely woful when, in all this tawdry fabric of civilization, a piece of money is so often set against a bitter tear, a shrewd bargain against a sick and tired heart; a phariseeism, such as Thou didst hate so much, against a life crushed out before its time!

Appendices

APPENDIX A

DISINFECTION

THE New York Board of Health has had printed much information concerning disinfection, etc. I understand that its literature is to be had very freely upon request, and that the Board is prepared to disinfect rooms upon application. The Charity Organization Society provides excellent circulars concerning preventive measures. There are private enterprises which undertake disinfection, among them the Lederle Laboratory, the West Disinfecting Company, and the Metropolitan Disinfecting Company, of New York City. Among manufacturing houses which provide sputum cups and like paraphernalia, disinfectants, etc., are the Messrs. Seabury & Johnson, Kny, Scheerer & Co., and Johnson & Johnson.

The tubercle bacillus is killed by moist heat (203° F., 95° C.) in one minute (Bonhoff and Fosher). Solutions of carbolic acid and of bichloride of mercury cannot be relied upon to disinfect sputum, at least in theory. Tuberculous sputum dried in air twelve hours will be completely disinfected by an equal amount of a 1:10 solution of izal. Chlorinated lime (1:50 solution) disinfects sputum. The cocci are destroyed more easily than the bacilli.

The following solutions and preparations are recommended:

Soap Suds Solution.—For simple cleansing, or for cleansing before or after disinfection by chemicals, one ounce of common washing soda should be added to twelve quarts (three gallons) of hot soap (soft soap) and water.

Strong Soda Solution.—Dissolve one-half pound of common washing soda in three gallons of hot water. This solution is stronger and more effective than the above. It should be applied by scrubbing with a hard brush.

Weak Soda Solution.—One ounce common washing soda to twelve quarts hot water.

Heat.—Boiling or steaming in closed vessels for one-half hour, or boiling in the weak soda solution in open vessels for the same time, will destroy all germs. The soda has the additional advantage of preventing rust in the vessels.

Dry Chloride of Lime.—This must be fresh and kept in closed vessels or packages. It should have the strong, pungent odor of chlorine.

Chlorinated Lime Solution is made by adding six ounces of fresh chloride of lime, having a strong odor of chlorine, to one gallon of water. It must be well mixed and should be prepared an hour before using. This solution, when fresh, is a reliable disinfectant and deodorizer.

Formalin is a 50 per cent. watery solution of formaldehyde. It must be fresh to be reliable. A five per cent. solution of formalin is an efficient deodorizer and a measurably good disinfectant. Large cloths or sheets hung in a room and sprinkled or sprayed with formalin may be used. Ten ounces of formalin are requisite for each one thousand cubic feet of air space. For

scientific disinfection, however, there must be fumigation. For this formaldehyde should be used.

Many proprietary disinfectants, whose composition is not revealed, are relatively expensive and often unreliable. It is essential to remember that deodorizers are not necessarily disinfectants; besides, they give an altogether fictitious sense of security.

The Illinois State Board of Health provides these simple, cheap, and reliable formulas:

STANDARD DISINFECTANT, No. 1.

Four per cent. solution of chloride of lime.—Dissolve chloride of lime of the best quality in water in proportions of six ounces of lime to one gallon of water.

This is one of the strongest disinfectants known. Discharges from the bowels of a patient suffering from a contagious or infectious disease, should be received in a vessel containing this solution, and allowed to stand for an hour or more before being thrown into the vault or water closet. Discharges from the throat or lungs should be received in a vessel containing this solution. Chloride of lime in powder may be used freely in privy vaults, cesspools, drains, sinks, etc.

Instead of the solution of chloride of lime, carbolic acid may be used for the same purposes, in a strength of $6\frac{1}{2}$ ounces to the gallon of water. This makes a 5 per cent. solution of carbolic acid.

STANDARD DISINFECTANT, No. 2.

Bichloride of mercury, 1:500.—Dissolve corrosive sublimate and muriate of ammonia in water, in the proportion of two drachms (120 grains, $\frac{1}{4}$ ounce) of each to the gallon of water. Dissolve in a wooden tub, barrel, pail, or an earthen crock.

Use for the same purpose and in the same way as No. 1. Equally effective but slower in action, so that it is necessary to let the mixture (disinfectant and infected material) stand about four hours before disposing of it. This solution is odorless, while the chloride of lime solution is often objectionable in the sick room on account of its smell.

STANDARD DISINFECTANT, No. 3.

Bichloride of mercury, 1:1000.—Dissolve one drachm (60 grains, $\frac{1}{4}$ ounce) each of corrosive sublimate and muriate of ammonia in one gallon of water. Dissolve in a wooden tub, barrel, pail, or earthen crock.

Use for the disinfection of soiled underclothing, bedlinen, etc. Immerse the articles for four hours, then wring them out and boil them. This solution is excellent for wetting the floors of offices, stores, workshops, halls, and school-rooms before sweeping.

Mixed with an equal quantity of water this solution is useful for washing the hands and general surfaces of the bodies of attendants.

Chloride of lime, carbolic acid, and corrosive sublimate are *deadly poisons*.

STANDARD DISINFECTANT, No. 4.

Milk of lime (quicklime).—Slake a quart of freshly burnt lime (in small pieces) with three-fourths of a quart of water,—or, to be exact, 60 parts of water by weight with 100 of lime. A dry powder of slaked lime (hydrate of lime) results. Make milk of lime not long before it is to be used by mixing one part of this dry hydrate of lime with eight parts (by weight) of water.

Air-slaked lime is worthless. The dry hydrate may be preserved some time if it is enclosed in an air-tight container. Milk of lime should be freshly prepared, but may be kept a few days if it is closely stoppered.

Quicklime is one of the cheapest of disinfectants. The solution can take the place of chloride of lime, if desired. It should be used freely, in quantity equal in amount to the material to be disinfected. It can be used to whitewash exposed surfaces, to disinfect excreta in the sick room or on the surface of the ground, in sinks, drains, stagnant pools, etc.

Dust from the walls, pictures, etc., in rooms that have been occupied by consumptive patients, contains the germs and produces tuberculosis in animals when used for their inoculation. Therefore, rooms should be thoroughly disinfected before they are again occupied. Rooms in which consumptives live should never be dusted with a dry cloth or brush. Carpets should be swept with a broom wrapped with a damp cloth, the latter being disinfected after use. Furniture should always be cleaned by wiping with a damp cloth, which should afterwards be burned or soaked in chloride of lime solution or by boiling for half an hour in a weak soda solution. Cleanliness in the house is of the utmost importance. Here impure air is likely to be rebreathed again and again. Moreover, fine particles of perhaps contaminated dust cling tenaciously to various surfaces, and especially to fabrics, even though there be considerable ventilation, so that thick carpets, plushes, velvets, rugs, furniture upholstered with roughened fabrics, and heavy hangings should not be swept with a dry broom and the deadly feather-duster, which distribute all over the room the dust gathered from corners and recesses. Moist tea-leaves, or some substitute for them, should be used before sweeping, and moist cloths should be used afterwards.

The furniture and ornamentation of the house should be as simple as possible compatible with a due regard to comfort and the æsthetics. Metal beds are extraordinarily cheap nowadays. Hardwood floors, if possible, and cane-seated chairs are desirable, as is a plain, smooth, unpapered, stained wall. For fumigating bedding, blankets, clothing, and other articles, formaldehyde is perhaps the best agency. The manufacturing houses provide it, with instructions upon the packages, stating the amount to be used for rooms of a given size. For thorough disinfection all the articles in a room should be fumigated, except such as are of so little value that they may be destroyed by burning. It is best to burn, if possible, such articles as have been soiled by the bodily discharges of the patient. Apparel made of cotton, linen, or flannel, and blankets should be thoroughly boiled for at least half

an hour. Silks, furs, and wraps should have the pockets turned inside out so that every part of the garment shall be exposed. Mattresses should be so placed that both sides may be exposed. Carpets should be taken up and placed upon chairs before fumigation. All the articles in the room during the occupancy of the consumptive should remain to be disinfected, and after the disinfection they should, as far as possible, be taken out and thoroughly aired. Before fumigating the room, all apertures, speaking tubes, keyholes, or fireplaces should be securely stopped up. The room should be left tightly closed for twenty-four hours.

After the room has been thoroughly aired the floor should be scrubbed with soap and water. The furniture and wood-work, walls and ceilings, should be brushed over with a moist cloth and then the room should be opened and left to air for two or three days before occupancy. If feasible, the walls should be repapered. Walls and ceilings, if plastered, should be washed with lime solution.

The test of thorough disinfection, as applied in the work of the New York Health Department by Dr. R. J. Wilson, is to suspend in the room to be disinfected the living bacillus pyocyaneus. On the day after disinfection the specimen is submitted to culture-test; if this test demonstrates the destruction of the bacillus, the disinfection is rightly considered to have been thorough and complete.

With regard to advanced and dying consumptives the problem of disinfection and cleanliness is as difficult as it is essential to consider. The patient is too sick and helpless to keep himself clean, and he will inevitably soil himself and his surroundings. There is frequent coughing and even vomiting, with much emission of infected matter. Everything must, therefore, be cleansed repeatedly and constantly. The bedlinen must be changed every time it becomes soiled. It must not be agitated, and must be removed before the broken-down tissue has had time to dry.

Latham's precautions with regard to hospital and sanatorium infection are:

The contents of cups and flasks are mixed with sawdust and burnt in special small crematories or incinerators, as should be also the sweepings, garbage, and refuse. The flasks are placed in water to which sodium bicarbonate has been added, and then gradually raised to 102° F., and kept at this temperature for half an hour. Handkerchiefs may be disinfected in a steam disinfection station, but destruction by burning is preferable whenever possible. The floors, etc., are cleaned by means of moist cloths dipped in a ten per cent. solution of chlorinated lime. The walls must periodically be well scrubbed. Linen, ordinary clothes, muslin covers, small mats, wicker chairs, mattresses, etc., are steam disinfected. Such articles as cannot be steam sterilized should be disinfected by formaldehyde. Crockery and knives and

forks are treated in ordinary surgical sterilizers. In Latham's plan there is a special dust destroyer attached to the engine-room of the sanatorium.

The following admirable rules have been adopted by the State Board of Health of Kentucky relative to the disinfection of railroad cars in the State, and the roads have agreed to abide by them:

All day coaches engaged in regular traffic shall be thoroughly cleansed after each trip at such points as facilities for the same have been provided. In no case shall such cleansing be less frequently performed than on every third day of use. In such cleansing, all rugs, matting, and upholstered back rests, when practicable, shall be removed from the coach to the open air for mechanical cleansing, and be exposed to sunlight when the prevailing meteorological conditions will permit. All interior surfaces in coaches are to be mopped, scrubbed, or cleansed at intervals of not more than ten days, with solutions of bichloride of mercury, carbolic acid, trieresol, or other disinfecting preparations preferred by any corporation and approved by this board as to ingredients and strength. Spittoons are to be provided in number not less than one for each seat in all smoking cars and in toilet rooms. Placards provided by this board shall be displayed at each end of all such coaches and in all waiting-rooms, indicating the importance of using the spittoons, and it shall be unlawful for any person to spit upon the floor or platform of any railway car or other public conveyance, or upon the floor of any waiting-room or platform in any station or depot.

All coaches of any kind in which an acute infectious disease has been carried shall remain closed and unoccupied after such person has been removed until it has been thoroughly cleansed and disinfected by the use of formaldehyde gas in quantities of not less than forty fluidounces of formalin to each coach. All day coaches in regular use for through travel are to be disinfected after cleansing by some method approved by this board at intervals of not more than ten days.

All toilet-rooms, water-closets, urinals, spittoons, and toilet appliances are to be scrubbed with soap and hot water and disinfected with formalin, or other approved method, after each trip, and shall be kept as clean as possible when on the road, and all similar rooms in stations shall be cleansed daily in the same way, and when vault or surface receptacles are used in stations these shall be disinfected daily with fresh lime. All preceding regulations in regard to cleanliness and disinfection shall apply equally to sleeping, dining, buffet, and parlor cars used in the public service. All blankets, curtains, and hangings used in sleeping cars shall be exposed to superheated steam, or other means of disinfection approved by this board, at intervals of not less than ten days, and all mattresses shall be so treated at intervals of not more than sixty days.

APPENDIX B

TONICS AND BITTERS

THE following were examined for the purpose of ascertaining the percentage of alcohol in each. Some of them have been recommended as temperance drinks (Report of Massachusetts Board of Health, 1902).

	Percentage of alcohol (by volume).
"Best" Tonic	7.6
Carter's Physical Extract	22.0
Hooker's Wigwam Tonic	20.7
Hop Tonic	7.0
Hoofland's German Tonic	29.3
Howe's Arabian Tonic, "not a rum drink"	13.2
Jackson's Golden Seal Tonic	19.6
Liebig Company's Coca Beef Tonic	23.2
Mensman's Peptonized Beef Tonic	16.5
Parker's Tonic, "purely vegetable," recommended for inebriates ..	41.6
Schenck's Seaweed Tonic, "entirely harmless"	19.5
Atwood's Quinine Tonic Bitters	29.2
L. T. Atwood's Jaundice Bitters	22.3
Moses Atwood's Jaundice Bitters	17.1
Baxter's Mandrake Bitters	16.5
Boker's Stomach Bitters	42.6
Brown's Iron Bitters	19.7
Burdock's Blood Bitters	25.2
Carter's Scotch Bitters	17.6
Colton's Bitters	27.1
Copp's White Mountain Bitters, "not an alcoholic beverage"	6.0
Drake's Plantation Bitters	33.2
Flint's Quaker Bitters	21.4
Goodhue's Bitters	16.1
Greene's Nervura	17.2
Hartshorn's Bitters	22.2
Hoofland's German Bitters, "entirely vegetable and free from alco- holic stimulant"	25.6
Hop Bitters	12.0
Hostetter's Stomach Bitters	44.3
Kaufman's Sulphur Bitters, "contains no alcohol." (As a matter of fact it contains 20.5 per cent. of alcohol and no sulphur.) ..	20.5
Kingsley's Iron Tonic	14.9
Langley's Bitters	18.1
Liverpool's Mexican Tonic Bitters	22.4
Paine's Celery Compound	21.0
Pierce's Indian Restorative Bitters	6.1
Puritana	22.0
Z. Porter's Stomach Bitters	27.9
Pulmonine	16.0

	Percentage of alcohol (by volume).
Rush's Bitters	35.0
Richardson's Concentrated Sherry Wine Bitters	47.5
Secor's Cinchona Bitters	13.1
Shonyo's German Bitters	21.5
Job Sweet's Strengthening Bitters	29.0
Thurston's Old Continental Bitters	11.4
Warner's Vinegar Bitters, "contains no spirit"	6.1
Warner's Safe Tonic Bitters	35.7
Warren's Bilious Bitters	21.5
Wheeler's Tonic Sherry Wine Bitters	18.8
Wheat Bitters	13.6
Faith Whitcomb's Nerve Bitters	20.3
Dr. Williams's Vegetable Jaundice Bitters	18.5
Whiskol, "a non-intoxicating stimulant, whiskey without its sting"	28.2
Golden's Liquid Beef Tonic, "recommended for treatment of alco- holic habit"	26.5
Ayer's Sarsaparilla	26.2
Thayer's Compound Extract of Sarsaparilla	21.5
Hood's Sarsaparilla	18.8
Allen's Sarsaparilla	13.5
Dana's Sarsaparilla	13.5
Brown's Sarsaparilla	13.5
Corbett's Shaker Sarsaparilla	8.8
Radway's Resolvent	7.9

The dose recommended upon the labels of the foregoing preparations varied from a teaspoonful to a wineglassful, and the frequency also varied from one to four times a day, "increased as needed." The proportion of alcohol in whiskey is ordinarily fifty per cent.¹

APPENDIX C

HYDROTHERAPY AND HARDENING

DR. SIMON BARUCH, after recognizing the unusual precautions that must be taken, on account of the varying conditions of individual phthisical patients against routine practice, advises this treatment:

After a thorough cleansing with soap and warm water, a day is allowed to elapse. The patient is wrapped snugly in a thin blanket like a mummy (unless rectal temperature is above 100°). He is allowed to lie for half an

¹Because of the agitation against harmful or fraudulent proprietary medicines, many alleged remedies have recently changed their formulæ; wherefore, one which was correct when the Massachusetts State Board made its analyses might not be true of present and altered conditions.

hour or longer unless he perspires. In afebrile cases it may be necessary to cover with additional blankets, the object being to fill the cutaneous arterioles preparatory to being treated with water. The face is bathed with water at 50° F. Now the blanket is opened over the chest and abdomen, and these parts are rapidly and well rubbed with water at 75° F. After drying, the patient is turned on the abdomen and the back is similarly treated. The extremities are not treated. Patient is gently dried, dressed, and if afebrile, ordered into the open air for a gentle walk. Febrile cases are returned to bed. This treatment is repeated daily with reduction of two degrees of water temperature at each ablution until 60° F. are reached. Now the ablution is performed just as the patient emerges warm from the bed, as follows: Standing in a foot tub, containing sufficient water at 100° F. to cover the feet to the malleoli, he receives a rapid friction bath with water at 90°, omitting the upper extremities, after which he is dried and sent into the open air if his rectal temperature is below 100° F. The water temperature is reduced daily two to five degrees until 60° F. are reached. Now the ablution is replaced by affusion, which consists of pouring four basinfuls of water at 90° F., previously held in readiness, over the body. The patient standing in a foot tub having the feet covered with water at 100° F., water is dipped from a vessel previously in readiness and poured with force over each shoulder and the back and chest. Rapid drying while standing on a warm towel completes the procedure. Beginning with a water temperature at 90°, it is daily reduced a few degrees until 60° or even 50° are reached. This refreshing process may be repeated daily. In febrile cases the water temperature should not go below 65°.

Jacobi observes the following:

Much has been said about hardening. What does it mean? Nothing but this: that the resistance of the child to the effect of external influences should be strengthened. Is there a uniform method applicable to every child, no matter of what age or constitution? Certainly not. But there is one object which should be accomplished in every infant and child,—viz., the invigoration of external circulation. The surface of a child from two to ten years measures from three to ten square feet. In and under that surface there is a lake of blood. In vigorous health this blood is in constant and rapid circulation. Within two minutes it enters and leaves the surface, comes from and leaves the centre of circulation, the heart. Slow circulation in the surface retards the flow of blood in the whole body, and impairs the nutrition of the heart and every organ, causing congestion and insufficient function, and disease. Rapid circulation in and under the skin, causing rapid circulation everywhere, propels the totality of the blood in the child's body (from two to six pounds according to age—from two to twelve years) into and through the lungs, in which the contact with and the absorption of the oxygen of the atmosphere take place. Now, the best stimulant of the circulation in general is, besides muscular exertion (exercise), the stimulation of the skin by cold water and friction. A child of two or three years should

have a daily cold wash, either after a warm bath, or standing in warm water which covers the feet, or lying on the attendant's lap or on a mattress. A brisk rubbing with a wet towel, one or two minutes, and with a dry towel until the surface is dry and warm, is sufficient. Older children may have a wet sponge squeezed out over them, this procedure being followed by the same effective friction; or they may plunge into cold water,—in the winter a single moment, in the summer several minutes. While in any bath, the skin should be thoroughly rubbed. This rule must not become a routine applicable to every individual. Cold water and friction require a healthy heart and a certain degree of strength. They only facilitate the reaction that should be looked for in every instance. The same healthy child, when taken sick or when convalescent from a disease, lacks the necessary vigor, and the routine must be interrupted. A child, under size and under weight, requires warmer water and friction. That is why a newly born baby or an infant of less than one or two years should be spared a low temperature. That is why also a child whose feet, after a bath or washing, do not get so warm as the rest of the body should be rubbed down not with cold but with warm water, or with a mixture of alcohol and warm water, until the constitution is gradually improved and fortified.

These rules appear simple; indeed, are simple. That is why the discussions of medical and lay journals met with lately are out of place. There are those who, with great earnestness, condemn hardening because they see colds, chills, or pneumonia after cold water treatment. If two do the same thing, it is not the same. It is with hygiene as it is with diet. The very young, the older, the healthy, and the sick, the robust, and the feeble, must not be treated nor fed according to ironclad rules. It has appeared to me that a few good rules, understood and intelligently applied, are a safer guidance than the forceful exhibitions of inexperienced medical juvenility as lately displayed in the magazines.

The following is based upon Cornet:

A sensitive patient, in the winter, begins with rubbings morning and evening, preferably by an attendant. He is put naked into a large, coarse sheet, and then rubbed with long, quick strokes, from head to foot, so that a strong glow may be brought to the skin. In a week or more the partial waist rubbing is begun. The patient lies in bed and his trunk and members are rubbed with a wash-rag wrung out of water (66° to 92° F.) until there is a ruddy reaction. Upon this the patient is covered again and rests for half an hour. Later, when the cutaneous vessels have begun to take on their normal functions, the full moist (or wet) rubbings are used with strong patients, especially in summer. The patient may be taken directly from his bed and given the treatment upon an empty stomach; or, weaker individuals may have a glass of warm milk or tea half an hour before; or, a short walk or a dry rub may precede, in order to induce a good reaction. The patient, entirely nude, is wrapped in a cloth wrung out (later wet) in five per cent. brine at 90° F., so that it comes in contact with the body all over, and is

then rubbed by an experienced man, with long, powerful strokes, until there is an agreeable feeling of warmth over the entire body. A wet cloth may be laid on the head to guard against headache. The entire rubbing lasts but one or two minutes, after which the patient is again laid in a dry sheet and again rubbed. He dresses without delay and goes out into the open air for at least half an hour. After his walk he takes breakfast. Weaker patients get into bed for another quarter of an hour. The temperature of the brine is lowered one degree daily down to 70°, 65°, or even 60°. This full rub should be done quickly, expertly, and energetically. Relatives and unskilled attendants should not undertake this work; headache, discomfort, and chilliness may result. The douche can be endured only by the very strong, and should be done in the physician's presence. The duration should be gradually increased from five to forty seconds; the temperature should be 90° to 95° F. or warmer. The patient must rub himself during the douche. After he is dried, he dresses himself and exercises in the air. The douches are absolutely excluded in very irritable cases and those with much sputum. They induce forced breathing and may lead to the aspiration of sputum. The rubs do not serve to cleanse the skin and are no substitute for baths. They seem, however, to harden the body against variations of temperature. They are a neuro-vascular stimulant, improving the "peripheral heart," and affecting favorably the appetite, the nutrition, and the mental condition.

APPENDIX D

EXTRACTS from a typewritten children's journal published under the guidance of Mrs. Rosenberg at the Bedford Sanatorium of the Montefiore Home, to give an impression of the social atmosphere in these institutions.

A NIGHTLY PRAYER.

Now I seek my nightly rest,
I pray it be both sweet and blest,
And may the day dawn bright and fair,
And happiness be in the air.

Her eyes are filled with a beaming love,
Just like the eyes of the angels above.

FLORA MENDELSON.

PROVERBS.

If we wish happy to be,
Let us never think of *Me*.
Love all, hate none,
Should be a standard for every one.
If we wish to be forgiven let us forgive others, no matter how hard it is.

MAMIE PELTZ.

Oh, how we do love our dear nurse;
We will always hear her melodious
voice.

"BLUE MONDAY."

This really hasn't anything to do with the color of the day. Usually when skies are blue it gives us bright and happy thoughts that we are going to have a nice day. But Monday is "blue" in another sense in contrast with Sunday. Indeed, many a Monday we feel blue in spirits,—yes, sometimes very blue. On Sunday everybody is in highest spirits and full of expectations. When we arise at morn we feel that we are going to have a pleas-

ant day and that something unusual may happen. We have our breakfast and then get dressed, which makes the thought of being here for our health disappear. At ten o'clock we are in joyous spirits. Almost every one is expecting some guest. Even those who do not have visitors take pleasure in seeing their friends with theirs. We spread ourselves all over the grounds on Sunday. We feel this is a great holiday. The time passes away quickly—all too quickly—and when we retire to bed we feel that the day has been well spent, but we dread the thought of Monday morning. We all wish there was no such day as Monday. We feel that there is some ugly spirit getting control over us; but we struggle hard till we gain the mastery over that spirit of ill humor and (perhaps) laziness,—for Monday is a busy day, and, after all, as the day advances, we find that we are making the best of things, then the blue fades out or changes to rose color.

ANNIE DUBENOFF.

Along with the general improvement, in ideas and in language, which may be observed in the writings of our contributors, we are rejoiced to announce a new poet in Flora Mendelsohn. Try again, Flora.

SANATORIUM NEWS.

The old garden benches have been repaired and painted and are of very great convenience to the patients.

The playground is now in full operation. The croquet game has been set up, as well as pole-tennis and lawn-tennis, and the place is now alive with happy, shouting people. In addition, a ball nine has scrap games behind the coal heap. Some of the younger and female inmates have little catching bouts of their own. Added to all this liveliness is the constant clang of the patrol-wagon bell, operated by Little Joey, about forty-eight hours in the twenty-four.

Mr. Moss and Mr. Fried were visitors last Saturday, and, as usual, were very much pleased with conditions here. Mr. Moss gave his usual Biblical reading to the children, and was attentively listened to by everybody.

In honor of Celia Pekelner's birthday last Sunday we had a little entertainment, which was enjoyed more than a big affair. It consisted of some songs, piano solo, and some imitations of a phonograph by the latest waiter; it would make you break your sides with laughter watching him. He was the one that made the hit that night.

The few hot days that we have had made a wonderful change in the appearance of things in nature. The leaves on the trees are coming out, the shrubs and bushes are beginning to blossom, and all the different wild flowers are springing up. Our fine lawn looks like a green velvet carpet. Wednesday it got a close shave from the lawn-mower, pulled by a new hired horse. It smelled fine.

A mad dog had us all badly scared on Sunday. He snarled and barked at nothing all the time, and Dr. Mendelbaum said he had visions. He was treated by the Hartfield cold-lead system.

Blasting has been heard a good lot around here; I think it was the shot of the Japanese.

The children are having a bully time picking violets and cowslips.

In spite of the cold nights last month most of the garden seed put in by the gardener is showing signs of growing. We expect to have a very fine garden this year.

ANSWERS TO CORRESPONDENTS.

Dear Editress,—Please be so kind and let me know why an owl can't see by day.—HEAVY WEIGHT.

Because it is a nocturnal animal not planned for day duty.

WANTS.

WANTED.—Hearts courageous to help us through our exercises at school commencement.

WANTED.—For the same day, clear skies and a punctual train for the visitors.

WANTED.—As many visitors on that day as possible to prove their interest in us and in our school work.

WANTED.—More adjectives to express our admiration for the budding beauties about us.

WANTED.—More rambles in the woods with Miss Teacher.

We now get up at half-past six in the morning, and the boys take their shower-baths before breakfast; they like the new arrangement very much.

A new calf was born at the barn on Wednesday, and Mr. Smith thinks it will be a prize animal. We now have a very fine herd.

DAVIS GOLDMAN.

APPENDIX E

TENTS AND TEMPORARY STRUCTURES

THE simple sanatory tent of Dr. Ulrich has the great merit of cheapness, and it may be of any size. Perhaps the best for a single person is ten feet

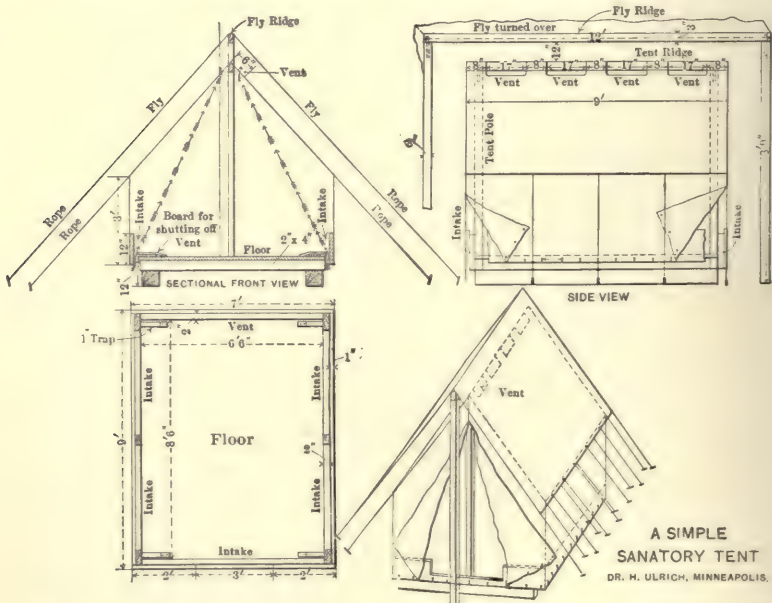


FIG. 117.—The Ulrich sanatory tent. (Dr. Ulrich's tent is mentioned on page 215.)

by twelve feet. It permits a stove in cold weather, and costs in Minneapolis \$22.50.

The floor is raised a foot from the ground. A framework of boarding

one inch by twelve inches is built around the border set one inch to two inches away from the edge and at right angles to the floor plane. This frame is rigid and extends at least two inches below the under floor surface. This arrangement gives the air intake or floor vent. The frame extends below the floor in order to make an angular entrance for the air, thereby avoiding direct draught. The floor and its framework are built to fit the inside of the dependent walls of the tent. In tent making there is always a play of several inches owing to the variations in widths of canvas and to technic. It is wise to instruct the maker to measure the base of the tent ordered and append the results to the delivery slip. The floor and its frame can then be built to fit snugly. The walls are attached to the outside and low down on the frame, overlapping liberally at the corners. All four walls can be rolled up, and reef loops are attached under the eaves to hold the rolled sides. The movable walls permit one to make a canopy or simulate the three, two, or one-walled shack.—*American Medicine*, May 27, 1905.

The Fisher tent is raised three feet above the ground. The air enters the space beneath the floor through louvre-boards or "luffer-boards" or flaps of cloth, which are simply like clapboards hinged at the upper edges and hanging one over the other. These flaps are hung at their upper edges by cords on the inside of a wire netting surrounding the base of the tent. Thus they open inward at the slightest wind pressure, allowing every breeze to enter the space beneath the floor, but not allowing it to escape, since the pressure from the inside against the flaps closes them. The air is thus forced up through the tent. Similarly, the sides of the cupola are provided with flaps of the opposite kind; that is, they are hung on the outside of a wire netting and yield to any effort of the air to escape from the tent, but close against any wind from the outside. The effect, therefore, is to produce "wind pump" ventilation, and to transform the slightest breeze into an upward current.

Free passage of air through the floor is provided by a space three inches wide between the tent floor and the walls of the tent, and also by two slits two inches wide in the floor, four feet from each end. These slits, as well as the openings on the four sides, may be closed by trap-doors, so that the tent may be temporarily heated in the morning when the patient wishes to dress.

The length of the tent runs in an east and west direction. The entire south wall consists of curtains which roll from the bottom on Hartshorn rollers, and may be put down in the daytime to sun out the tent, or on hot, close summer nights when the air is absolutely still. In cold weather even when the air is still, the curtains need not be lowered, as the difference in temperature between the breath exhaled and the surrounding atmosphere is enough to cause the exhalations to rise and pass out of the cupola openings. To provide for this there is a small space above the flaps in the cupola always open, and also above the flaps around the base of the tent.

One other device needs to be explained. This is a regulator under the floor of the tent and in the centre. It performs two functions: the first and most

important is to distribute the air evenly to all four sides of the tent; the second is to check the motion of the air when it is excessive, as in a gale. A false floor of canvas is constructed a foot below the real floor, and in the centre of this false floor is an opening five by seven feet, covered with wire netting and provided with flaps like those already referred to, but hanging down from the wire netting at an angle of less than 45° . Half of them—namely, those toward the east—are hung at their east edges; the other half, toward the west, are hung at their west edges. Consequently the air, passing through these flaps, is distributed half toward the east and half toward the west, so that each end of the tent is supplied with its full share of air, whatever the direction from which the wind is blowing. It is found that without this distributing apparatus the air is apt to come up on the side of the tent most remote from the direction of the wind, and even in some cases to produce a revolving motion of the air in the tent, causing a down current on the windward side. With the regulator, however, this never happens. In case of a gale the flaps in the regulator, which usually hang open, are blown shut and keep out an excessive quantity of air. The flaps at the extreme east and west are lightest and close first. The weights of the remaining flaps are graduated, so as to close successively in proportion to the severity of the winds.

The wire netting to which these flaps are attached is surrounded by canvas screens projecting seven inches downward from the false door, so as to constitute a short shaft, as it were, thus compelling the air, before reaching the flaps, to already have a general upward direction. The mechanism which has been described thus performs four functions: (1) The flaps surrounding the base of the tent act like in-draught fans. (2) Those in the cupola act like suction fans. (3) Those in the central opening in the false floor distribute the air evenly. (4) The latter also check excessive draughts. The result is that the tent automatically provides pure air for its occupants, without draughts, and in all conditions of weather, with the single exception of weather which is both hot and still, in which case it becomes necessary to lower the curtains.

This description is from the report of the Baltimore Exposition. There was there also shown a structure, half tent, half shack, to contain five beds and costing: for dressed lumber and shingles, \$56; canvas, \$14; and labor, \$18,—\$88 in all.

The Gardiner tent is sixteen feet wide, and in lots of twenty-five costs about \$90 each. Improvements have been devised since these cuts were made, and it now has a wall six feet high, so as to allow proper height for a wooden door. Many tents are also made with a vestibule some eight feet or ten feet long, which allows space for a trunk, closet to hang clothes, etc.; also, in some instances, a wainseoting has been built of wood inside the tent, two or three inches from the wall, extending to within three or four feet in height from the floor. The air then enters the tent as usual, passes up the wainseoting, and flows over the top of the same, instead of entering at the floor level.

The flooring is made of four-inch tongued and grooved pine boards, supported by joists of two by four-inch timber bolted together, the intermediate shorter timbers on the outside being also two by four inches. The uprights

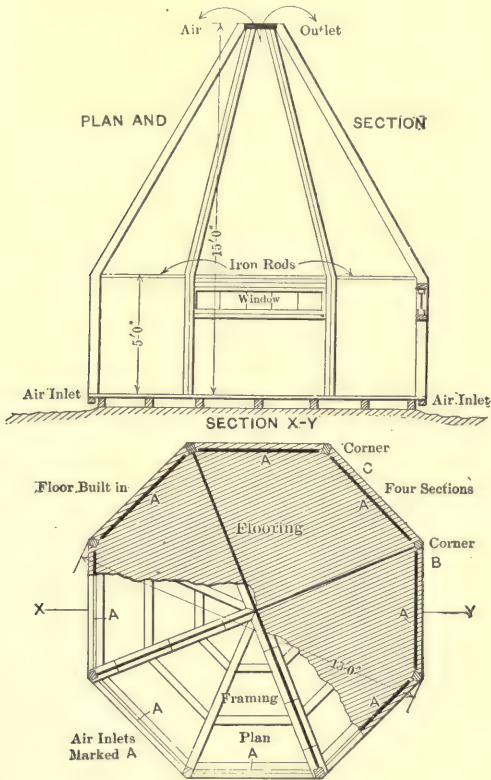


FIG. 118.—The Gardiner tent.

are made of two by three-inch joists, the rafters also measuring two by three inches, the wood being reinforced by angle irons or plates, as shown.—*American Medicine*, May 27, 1905.

The Nordrach tent is octagonal in shape, with an oiled floor and strong frame of wood and iron, covered with fifteen-ounce double filler army canvas. A narrow ventilator, which can be opened or closed, passes around the edge of the floor on four sides, and a galvanized iron stationary ventilator, umbrella-shaped, fits into the apex and is opened or closed by means of a damper. There are doors, and the furnishings are an enamelled iron bed, soft warm bedding, a bureau, toilet table, rugs, chairs, a stove, and a wardrobe which is built into the tent itself. (See page 476.)

Details regarding the Ducker tent will be cheerfully furnished by the Ducker Company, 277 Broadway, New York City.

The Tucker tent is thus described in "Some Methods of Housing:"

A combination roof and fly ventilator with regulator attachments placed in the centre of the top of the tent.

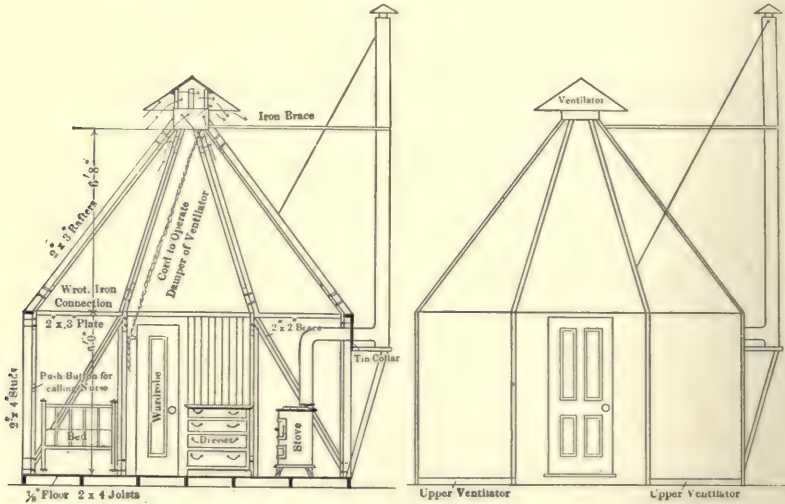


FIG. 119.—The Nordrach tent. (See page 475.)

Two awning frames making up the front wall of the tent. These may be raised at various angles as awnings, or removed entirely so as to admit the free entrance of sunlight.

A side wall ventilation compartment consisting of a hinged width of drop-siding opening downward on the outside wall and having in a corresponding position on the inside wall another wider board hinged at the bottom and capable of being opened at any desired angle. The method of controlling the inlet of fresh air is designed to keep the floors of the tent free from any draught.

A fly extending one foot over the edge of the tent and ten inches above and parallel to the roof, allowing a free circulation of the air over the entire roof of the tent.

A four-panel, hand-made screen door, wire screen cloth for all openings, two six-light windows, lumber for frame, floor and sides, all finished, cut to measure and ready for assembling, together with twelve-ounce, double-filled Monarch army duck cut in proper sizes for roof, fly, and walls of tent, complete the outfit, which is sold at Denver, Col., at \$75 for size eight by ten feet, and at \$100 for size twelve by fourteen feet.

Homer Folks thus describes in "Some Methods of Housing" the pavilion tents at the Metropolitan Hospital Infirmary:

The tent-cottages are an adaptation of a tent-cottage devised by Dr. Holmes, of Denver, Col. The frame is made of wood with the outside walls boarded half way up. Above this are two frames covered with canvas. The inner frame is so arranged that it can be lowered to the floor just inside

the wall of the lower half of the tent. The outer frame can be raised outward so as to form an awning. There is a space of four inches between the inside and outside walls. The outer canvas frame extends from the roof to within four inches of the wood portion, and the inner canvas frame extends to within four inches of the roof of the tent, so that when on account of storm or other reasons the upper half of the walls of the tent are closed there is a continuous circulation of air entering just under the roof. The tent-cottage

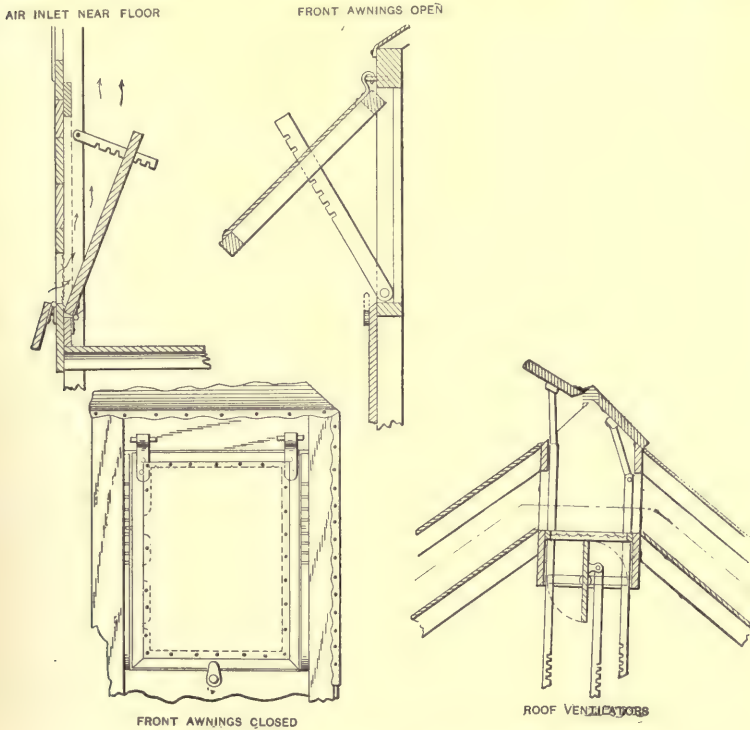


FIG. 120.—Details of the Tucker tent.

combines the maximum of ventilation with the minimum of exposure to the weather. It is more comfortable and easily managed than the ordinary tent. A door is placed at each end, and above the door are two canvas windows swung on pivots. The tents measure sixteen by thirty-two feet, the sides being eight feet high and the centre of the roof fifteen feet. Each tent contains twelve beds. The floor of the tent is sixteen inches above the ground, with free circulation of air underneath.

The illustrations and specifications will show the details of the construction work. Walls are not plastered; windows and doorways are not elaborate structures such as are ordinarily put into buildings of a more permanent character, and colored ticking and not canvas is used. Ticking gives greater freedom of ventilation than does canvas, and, being colored, the glare which

is so disagreeable a feature of many tents is eliminated. Two or more openings in the inside roof for better ventilation would be a desirable addition to these tent-pavilions.

SPECIFICATIONS.

Twenty stone piers.
 Five 4 x 4 x 32 sills and plates.
 Fourteen 4 x 4 x 14 posts.

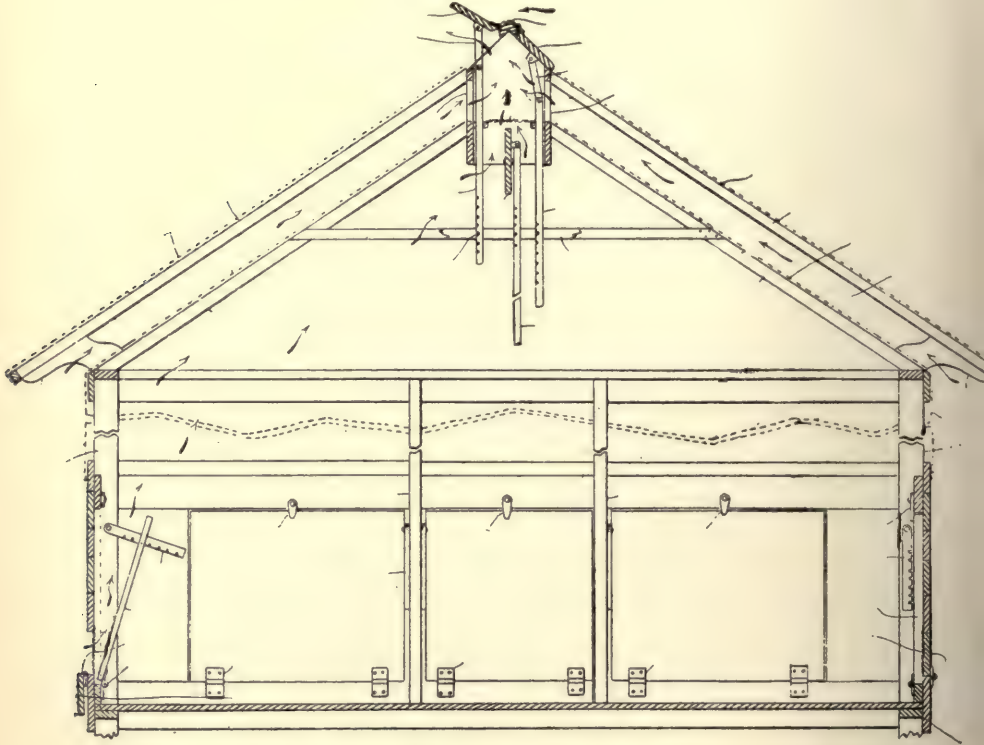


FIG. 121.—The Tucker tent. (See page 476.)

Fourteen 2 x 4 x 14 studs.
 Sixteen 4 x 4 x 18 joists, 24-in centres.
 Seventeen 4 x 4 x 20 rafters.
 Eight 1½ x 6 x 12 collar ties.
 Total, 1335 ft.

700 ft. Georgia flooring.
 450 ft. 5-in. lap siding.
 12 sash frames.
 2 door frames.
 110 ft. window sill.
 Two 1½ x 4 x 14 ft. corner boards.
 115 yds. ticking.
 Painting, hardware, nails, and six days' labor.

If roof is used:

Eight 2 x 5 x 22 rafters	147 ft.
Twelve 2 x 5 x 16 plates and studs	196 ft.
Total,	343 ft.

Details concerning the experimental camp noted in Part VIII, Chapter I, are thus set forth in *The Outdoor Life* for October, 1904:

The dimensions are thirty-nine by fifty-two feet (multiples of thirteen feet), the length of an ordinary board being taken for economic construc-

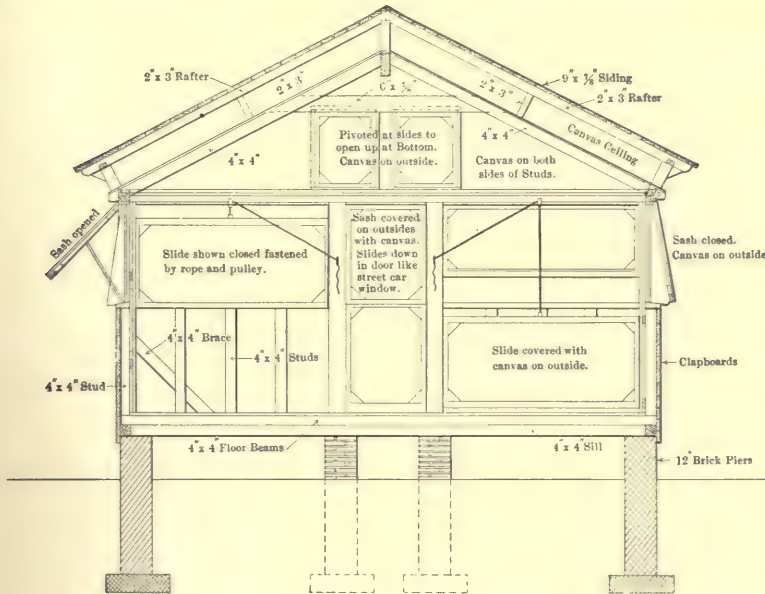


FIG. 122.—Pavilion tent at Metropolitan Hospital Infirmary.

tion. There are three rooms on each side, thirteen by thirteen feet each, and an open space in the centre twenty-six by twenty-six feet. Ordinary matched boards, battened, are used for sides and floorings. The roofs are of best cedar shingles. Rustic work is used where most effective for trimming, but sparingly. The first cabins or sleeping-rooms nearest the camp-fire are entirely open in front, and Japanese screens are used for privacy. Curtains or rubber sheets could be substituted to keep out the morning light, but the screens are very satisfactory, the occupant being invisible to those around the camp-fire, but having sufficient light to undress by. Of course the ventilation of these rooms is perfect. The rooms furthest away from the camp-fire were finished with four walls and a door opening on the platform in front of the fireplace, out of deference to the women, who objected to the Japanese screens as not affording them sufficient privacy. The middle rooms were left unfinished for six months while the question of walls and doors, which could be bolted, or screens was considered. The men preferred the

open fronts with screens; the women the closed fronts with doors. The matter was finally compromised with a door and a big window four feet from the ground with three sliding sashes, which can be pushed back and leave a large air-space at night. Each room has one window opening into the outer air. The corner rooms have two windows. The closed fronts and doors have this advantage. By covering the outside of the window with mosquito screens and having the sashes open inwards, the rooms can be cleared of insects early in the evening by a smudge built in a tinsmith's furnace or in a tin pail. The door being left open all mosquitoes are driven out. Then close the door, remove the smudge and open the window, and the smoke is speedily driven out, leaving a room free of smoke and mosquitoes for the night,—quite an important consideration in the Adirondack forest in June and July. In the open-front sleeping-rooms with Japanese screens this is, of course, impossible. Bearing in mind that each of the three rooms at the sides is thirteen feet square, and that the open space with the raised roof is twenty-six feet square, this leaves an open space, on a raised platform with three steps, thirteen by twenty-six feet in front of the fireplace, which is built of field stone and is of ample dimensions to take a stick four feet long. This open space, thirteen by twenty-six feet, is used for a dining-room. In the rear the chimney is utilized to take the smoke-pipe of a cooking stove, and around this is built a kitchen, eight by thirteen feet, one side being left open that the cooking may be done absolutely in the open air, with reasonable shelter from the rain. This kitchen is found to be not quite large enough, but it can be extended for any required length, and can be as readily made twenty feet as eight feet long. The open side of the kitchen faces a running brook about twenty-five feet from the house.

Cost.

Rock foundation for camp-fire, 16 x 16 and 4 feet high, ample room, absolutely safe.....	\$98 16
Chimney and fireplace	108 99
Carpenter work	990 07
Rustic work	75 00
Toilet, freight, and incidentals	35 26
Printing	41 50
Total	\$1,348 98

Being on an island, far up the lake, the carpenters' and masons' bills included boat hire. The building could be put up in most places nearer to Saranac Lake for \$1200, and will accommodate six persons, each having a room to himself or herself. With extra cots, it will comfortably hold twelve.

The average cost per head, fully equipped for camping, with stove, kitchen utensils, good bed, mattresses, and ample blankets, towels, etc., for eight persons is less than \$200 per head.

In such a building, for six or seven months of the year, the State could house five times the number of persons they could accommodate in any brick buildings, with better sanitary surroundings, the patients living absolutely in the open air and yet sheltered in stormy weather as perfectly as in any house.

The lean-to in use at the Loomis Sanatorium is thus described by Dr. H. M. King in "Some Methods of Housing:—"

It has a floor space of forty by twelve feet, giving room for eight thirty-inch beds. The lumber used for its construction presents a plain surface on

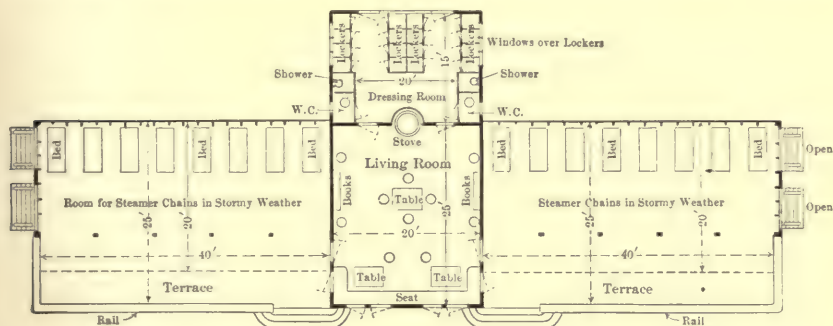


FIG. 123.—Ground plan of improved lean-to.

the interior, neither painted nor stained, and the exterior is covered with cedar shingles, stained green. The total cost up to this time was a little less than three hundred dollars. For obvious reasons, it became necessary to hang curtains between the stanchions along the front of the building. For this purpose, we procured a curtain made of awning material, weighted with a sliding rod with perforations at the ends through which wire guys were passed. These curtains were hung on two and one-half-inch Hartshorn rollers, and have proved durable and otherwise satisfactory. Seven of these were required, costing complete \$30.

This structure was occupied all summer by patients, who were, however, compelled to use their quarters in the main building of the annex for dressing, bathing, etc. In order to make the lean-to serviceable for the winter without too great exposure and inconvenience to the patients occupying it, it was necessary to provide a heated dressing-room. This addition has eight clothes-lockers, a shower-bath and toilet, a hot-water boiler and a round stove containing water coils which heats the apartment and provides sufficient hot water for bathing purposes. A hand basin with hot and cold water taps is included. This addition was placed directly back of the lean-to, the door opening to the latter replacing the middle ventilator. The cost of this addition, including labor and construction, plumbing, sewer connection, and heating apparatus, was \$280, making the total of the building, exclusive of the curtains, \$580, or \$72.50 for each patient. It has been occupied more than a year with the most satisfactory results.

The latest modification of this simple structure we are now building, also in connection with the annex of the Loomis Sanatorium. A clear idea of it can be gathered from the accompanying illustration and floor plans. It really consists of two lean-tos, somewhat larger and more elaborately built than was the first, connected by a commodious sitting-room, which can be used in inclement weather, each lean-to opening into this room by a Dutch

door as shown in the plan. This room, as well as the double-locker room directly back of it, is heated by a larger stove, which, as in the original lean-to, also supplies hot water for the baths and hand basins. The interior finish of the sitting-room and the locker-room is hard pine, filled and varnished; the exterior is covered with cedar shingles and left to weather-stain. Exposed smooth surfaces, except the floor, are painted. All of the floor which is exposed to rain or drip is, at the suggestion of W. H. Scopes, of Saranac Lake, laid of three-inch material with one-half-inch spacing. The surface of each floor plank is slightly rounded, thus avoiding the curling which would necessarily occur in an ordinary plain floor exposed to the weather.

The cost of this building, exclusive of curtains, was \$1830, and provides accommodations for sixteen patients, thus making the cost per patient slightly more than one hundred and fourteen dollars. The only essential advantage which it possesses over the first building is that it gives ample space for each patient's rest chair placed at the foot of his bed and protected from the weather. Aside from this, it provides several unessential features which conduce to the patient's comfort.

Unquestionably, buildings of this character providing outdoor sleeping accommodations and warmed sitting-room, locker-rooms, bath and toilet, can be erected under favorable conditions at \$100 per patient, or less. To make this plan possible it is, of course, necessary to have a central administration building in which are located the various offices, dining-hall, kitchen, infirmary, and staff and servant quarters. A sanatorium of this character, with a capacity for one hundred and fifty patients, under municipal, county, or State control, and designed to reach early ambulant cases of tuberculosis among the poor, would cost approximately as follows:

Main building, three stories and basement, the latter containing the kitchen; the first floor the various offices and the dining-hall; the second floor the infirmary, diet kitchen, etc., and possibly the doctors' quarters, and the third floor, quarters for the staff and servants, \$50,000.

Various outdoor buildings, such as cold storage plant, stables, etc., from \$10,000 to \$15,000.

Lean-tos for the accommodation of one hundred and fifty patients, \$15,000, making a total, exclusive of land, of \$80,000, or about \$533 per patient.

Most of the existing sanatoria intended for this purpose have cost from \$1000 to \$5000 per patient, and fulfil the essential requirements for open-air cure no better and probably not as well as does the lean-to plan. If we expect to give sanatorium training and treatment to those of the poor who may be afflicted with early tuberculosis, it is necessary that we materially reduce the cost of construction, equipment, and maintenance in sanatoria intended for this purpose. Otherwise it seems to me that we are entering upon an utterly hopeless undertaking.

BILL OF MATERIAL FOR IMPROVED LEAN-TO.

- 8 pieces hemlock, 4 in. x 8 in. x 16 feet sills.
- 6 pieces hemlock, 4 in. x 8 in. x 18 feet sills.
- 1 piece hemlock, 4 in. x 8 in. x 20 feet sill.
- 2 pieces hemlock, 4 in. x 8 in. x 22 feet sills.

- 12 pieces hemlock, 4 in. x 8 in. x 16 feet girders.
 11 pieces hemlock, 4 in. x 8 in. x 10 feet girders.
 56 pieces hemlock, 2 in. x 8 in. x 16 feet floor joists.
 36 pieces hemlock, 2 in. x 8 in. x 20 feet floor joists.
 14 pieces hemlock, 4 in. x 4 in. x 12 feet, surfaced 4 sides, plates.
 54 pieces hemlock, 2 in. x 6 in. x 18 feet, surfaced 4 sides, rafters.
 5 pieces hemlock, 2 in. x 6 in. x 16 feet, surfaced 4 sides, rafters.
 75 pieces hemlock, 2 in. x 4 in. x 14 feet, surfaced 4 sides, studding.
 50 pieces hemlock, 2 in. x 4 in. x 12 feet, surfaced 4 sides, studding.
 6000 feet No. 2 N. C. shiplap sheathing.
 2500 feet No. 2 N. C. rift gr. flooring, $\frac{7}{8}$ x $2\frac{1}{2}$ inches.
 2200 feet $\frac{1}{2}$ in. N. C. ceiling, No. 1, interior of living room.
 800 feet $\frac{7}{8}$ x 4 in. (10 feet length) N. C. pine, slightly rounded on top for exposed flooring, to be laid $\frac{1}{2}$ in. apart.
 40,000 red cedar shingles, 16 in. clears 5 to 2 in.
 8 sash 10 x 10 4-light $1\frac{1}{8}$ in. glazed S. S.
 6 pr. French windows, 3 x 4 ft. 6 in. $1\frac{3}{8}$ in., 48 lights.
 2 Dutch doors 3 ft. x 6 ft. 6 in., $1\frac{3}{8}$ in., top 1 lt., D. S. Bot., 2 Pan., F. M. 2 sides, No. 1 cypress.
 2 doors 2 ft. 8 in. x 6 ft. 8 in., $1\frac{3}{8}$ in. 4-Pan., F. M. 2 S.
 2 doors 2 ft. 8 in. x 6 ft. 8 in., $1\frac{3}{8}$ in. 4-light 2 Pan., F. M. 2 S., No. 1 cypress.
 4 stationary blinds and air boxes for ventilators.
 500 bricks for chimney.
 58 brick piers, cement below surface through frost line.
 Plumbing—2 toilets, 2 shower baths, 2 wash basins, 1 heater and hot water stove combined, 16 lockers 2 ft. square, with screen doors.
 Painting—Interior of living room filled and varnished; also toilet and locker room. All outside trimmings painted.
 Cupola—According to plan.
 Total cost, including labor and construction, \$1830.

BILL OF MATERIAL FOR ORIGINAL LEAN-TO.

- 10 pieces 4 in. x 6 in. x 14 ft. hemlock, rough, for sills.
 2 pieces 4 in. x 6 in. x 12 ft. hemlock, rough, for sills.
 19 pieces 2 in. x 8 in. x 12 ft. hemlock, rough, for floor timbers.
 6 pieces 2 in. x 8 in. x 14 ft. hemlock, rough, for floor timbers.
 28 pieces 2 in. x 4 in. x 14 ft. hemlock, rough, for studding and plates for dressing-room.
 12 pieces 2 in. x 4 in. x 16 ft. hemlock, rough, for rafters and collar-bone for dressing-room.
 850 feet hemlock, rough, boards, sheathing and floor lining.
 9 pieces 4 in. x 4 in. x 14 ft. hemlock, planed on four sides for plates.
 4 pieces 4 in. x 4 in. x 16 ft. hemlock, planed on four sides for bearing columns.

- 20 pieces 2 in. x 4 in. x 16 ft. hemlock, planed on four sides, for studding and shed roof rafters.
 21 pieces 2 in. x 6 in. x 14 ft. hemlock, planed on four sides, for rafters.

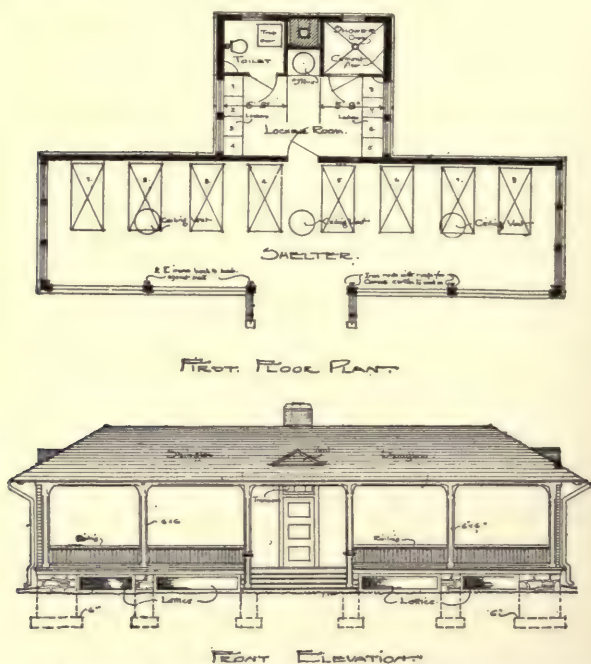


FIG. 124.—Plan of proposed shelter, country branch of the Rush Hospital for Consumptives, Philadelphia.

- 9 pieces 2 in. x 6 in. x 12 ft. hemlock, planed on four sides, for outriggers.
 600 ft. No. 2 rift flooring, N. C. pine.
 1000 ft. No. 2 Co'n flooring, N. C. pine, for floor sides.
 Ceiling, lockers, and toilet—1500 ft. No. 2 hemlock flooring, for sheathing on sides and roof of lean-to.
 88 ft. $\frac{7}{8}$ in. ceiling N. C. pine, for shutters.
 500 ft. soft pine for cornice casings and corner boards.
 14,000 red cedar shingles.
 1 window $1\frac{1}{4}$ sash, 24 in. x 24 in., 2 lt.
 1 door 2 ft. 6 in. x 6 ft. 6 in. x $1\frac{1}{2}$ in., 4 lt.
 1 heater and hot water stove combined.
 1 toilet and one shower bath.
 8 lockers, 2 ft. square, with screen doors.
 Paper—Floor, sides, and ceiling lined with tar paper.
 Painting—Interior of dressing-room filled and varnished. Outside of building stained with creosote stain.
 Total cost, including labor and construction, \$580.

A structure akin to the "lean-to" is the Rush Hospital "shelter," shown in Fig. 124.

Dr. Mary E. Lapham, of Highlands, N. C., describes in the *American Medicine*, April 1, 1905, an excellent tent which she has devised, which is now in use in a little village high up in the North Carolina mountains. Apparently it succeeds in avoiding the disadvantages of tent life while retaining its advantages. The direct rays of the sun enter as freely as in a greenhouse. The tent is flooded with light, never dark, even in the dulllest day, and yet

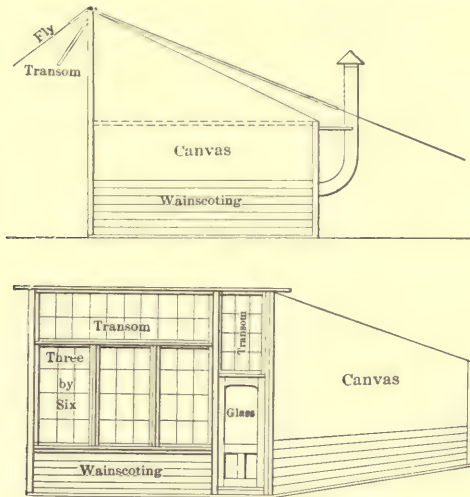


FIG. 125.—The Lapham tent.

perfect ventilation is secured, together with freedom from draughts and protection from sudden cold and damp changes in the weather. The patient can walk back and forth alongside of fourteen unbroken feet of glass, and on the other side of the tent is a blazing fire of logs. The whole effect is one of an abundance of light and warmth, while in reality the air is constantly cool and fresh for the lungs. The feet and legs are kept warm by the open fire; the lungs and head are cool from the air coming in through the canvas roof and sides. A work table in front of the windows, a large, comfortable rocking-chair, cupboards in the corners for books and papers, giving the patient that sense of being at home and of being surrounded by his Lares and Penates, so advantageous to an invalid settling down for a few months of enforced and unaccustomed leisure.

The tent is built as follows: It is a lean-to, twelve feet high in front, facing the south, five feet at the back, twelve feet wide, and fourteen feet long. The southern exposure, fourteen feet long and twelve feet high, is all of glass from the wainscoting up. The floor rests on sills, raised a foot or more from the ground. It is made of matched lumber an inch thick, is double, and contains a two-inch air space. The wainscoting across the northern exposure is five feet high and thirty inches around the other three sides; it is closely and firmly keyed to the floor by mortise and tenon. It is made of matched lumber, is double, contains a two-inch air space, and is lined with tarred building paper.

The canvas roof and sides are laced to this wainscoting through rings. Over the roof a fly is stretched and held in place by ropes. In the centre of the north wainscoting is a thimble for the stovepipe.

The glass front is composed of two transoms, one door with a glass window, and three windows. One of the transoms is three feet by four feet, the other three feet by ten feet; both are easily swung out from within and held in place by a system of levers. The windows are each three feet wide and six feet long. They all swing out, and thus the whole front is thrown open to the air.

The combination of glass and canvas has many advantages. The tent is practically a sun parlor, in which every inch of space is accessible to the direct rays of the sun, excepting just below the south wainscoting. Thanks to the high transoms, the sunlight enters as freely as though the whole roof was of glass. Thanks to the canvas roof and transoms, there is no scorching, burning heat. The tent has no cold spots, no draughts of cold air, the patient is perfectly protected from cold winds and sudden changes in the weather, and yet there is the freest possible interchange of air through the canvas and opened transoms. All the superheated air at once escapes, and thus the heat of a close tent in a midsummer day is never encountered. In warm weather the fly is extended down and out, like another half of the tent, making a porch and preventing the direct rays of the sun from striking the glass. In warm weather the sides of the tent may be pegged out, leaving only a huge umbrella under which one may sit in perfect comfort even in our hottest weather (86° F.). When the weather is cold the tent is always warm, so long as the sun shines, even in our coldest weather (20° F.), and warmed equably throughout. There is no shade within the tent, no dark, damp places. When the sun does not shine, the tent is heated by a fire of blazing logs, within a fireplace made of sheet iron after my design. It is something like a Franklin stove, and has a blower, so that the fire burns promptly and heat is furnished at once. These open fires are very desirable: the feet and legs are warmed, the head and lungs are cool, they are a great source of pleasure to the patient, and materially assist in making the time pass agreeably.

"The floor and woodwork of this tent are finished in hard oil. There are comfortable rocking and Morris chairs, and a generous table in front of the windows. A single iron bedstead on either side the fireplace, a bureau and a washstand complete the set. Around the bed is a framework like that of a four-poster, over the top of which is stretched a light cover to shield the eyes. (There are no mosquitoes in this region.) Around the sides at the head of the bed are curtains hung on rings, which may be closed against too bright a light or a cold night wind. The cover, the curtains, the counterpane and valance are made of some pretty washable material, such as blue and white percale, and the effect is really very pleasing." This tent is very easily stored or transported, being divisible into sections for loading on wagons.

Dr. Biggs's tent-house is thus described in "Some Methods of Housing:"

The house should be supported on brick or stone piers starting just above ground and extending below frost, ten piers in all or one under each post.

The sill pieces to be placed on the piers should be six-inch by eight-inch with the eight-inch side vertical, and the floor beams should be two-inch by ten-inch placed sixteen inches from centre to centre; or two-inch by six-inch floor beams may be used by placing an additional sill or girder under the centre lengthwise of the house. Set the floor beams so as to give a slight slope to the porch.

All framing timber should be of good quality spruce or hemlock. Where it is to be left rough and stained, small, sound knots are not objectionable, but if to be planed and painted the material should be as free from knots as possible.

The outside of the sills should be cased with a seven-eighths-inch pine or cypress board and the floor laid over the whole with seven-eighths-inch mill-worked, matched North Carolina pine boards not over three and one-half inches wide.

On top of the floor set the main posts of four-inch by four-inch pieces with girt under the openings of two-inch by four-inch and filling-in studs of two-inch by four-inch about twenty inches apart, set flat. Provide the main plates and cross-beams of four-inch by six-inch pieces, the ridge piece two-inch by twelve-inch over the tent portion only and the rafters two-inch by six-inch throughout. The horizontal pieces of the outhangers should be four-inch by four-inch and the brace and tie members two-inch by four-inch all strongly framed together.

The window and door frames may be of simple jambs and casings, nailed direct to the studs; and the sash and doors may be of the regular stock make. Inclose the sides of the dressing-room and the lower part of the tent-room with good novelty or coved siding cut in between the posts and nailed to the flat studding and cleats on the posts.

Provide the cornice moulding and ridge boards on the dressing-room and cover the roof with shingles on slats.

Screens should be placed as shown. These may be placed directly on the studs, but will be more durable stretched on simple frames and these secured in place.

Place a double canvas cover over the tent-room and extend the outer cover over the porch with flaps coming down to the dotted line and buttoned to the horizontal beam. This outer cover is to be guyed with short rope fastened to rings in the lower edge of the canvas and secured to the horizontal member of the outhanger.

The inner canvas is to be drawn to the plate with ropes tied in rings, which are to be secured to the underside of the canvas near the plate. This canvas continues down to the bottom of the screen but is divided, forming a flap over each screen so that it may be rolled up or buttoned down at will. Similar flaps should be provided at the end over the portions marked for screens and over the two triangular openings where no screens are placed. There should be a separate flap for the door, and in the inner canvas four

ceiling openings with flap covers are arranged to be rolled up and down and to be operated with ropes.

Proper eyelets are to be placed in the canvas and buttons in the framework wherever flaps are to be buttoned down.

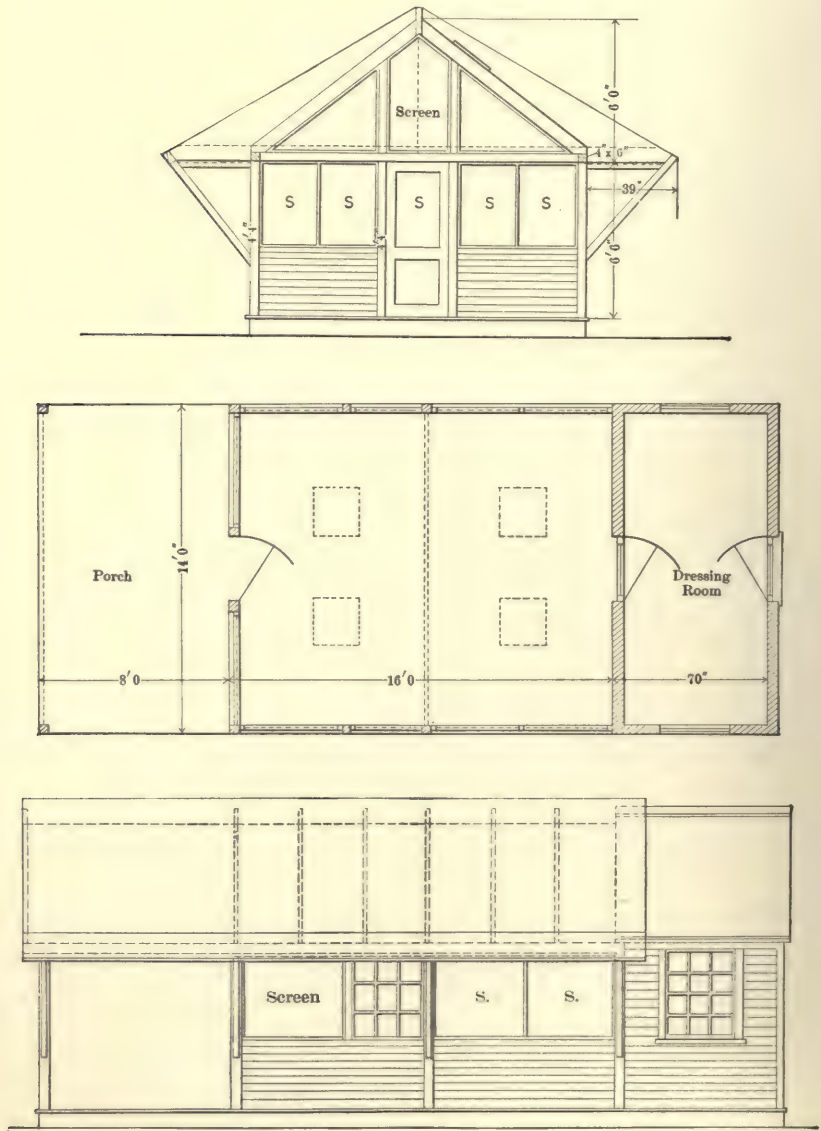


FIG. 126.—Dr. Biggs's tent-house.

Provide hinges and bolts for the two windows in the dressing-room, and suitable locks and hinges for the three doors.

The entire framework may be left rough and the whole stained a moss-green, or other suitable color, or it may be planed and painted.

The Nathan cottage is built of yellow terra-cotta bricks and finished inside with hard maple. All the moulding edges are rounded and, for the easy removal of dust, the doors are plain veneered without panels.

The cottage is so situated that the verandas have a southwesterly, southerly, and southeasterly exposure, with glass shelters on the east, north, and

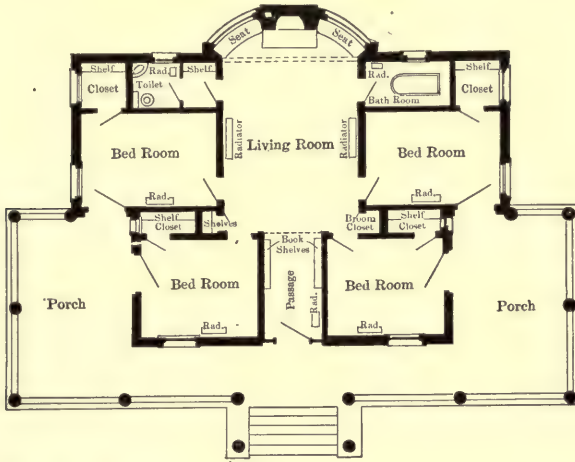


FIG. 127.—Plan of Nathan Cottage at Saranac Lake. (See page 222.)

west, thus insuring protection and the maximum of sunshine for patients sitting out of doors through the winter months.

It is built to accommodate four persons, the sitting-room is in the rear, and four bedrooms in front are accorded the best exposure. To permit the patients' beds to be rolled outdoors, each bedroom is provided with a Dutch door—a combination of door and window—opening directly on the veranda.

The verandas are arranged so as not to shade the rooms from the sun, and the building may be ventilated in several different ways without a draught striking the patient. By means of transoms, all windows and doors are brought flush with the ceiling. Each bedroom has a large closet, well ventilated by a window. The bath-room and lavatory are in separate rooms.

The cottage is equipped with electric light, a hot-water heater, an open fireplace in the sitting-room, and hot and cold running water. Each bedroom is supplied with a white enamelled iron bed on large rubber rollers, an iron toilet stand, a glass-topped table, plain finished hardwood bureau, and two chairs.

APPENDIX F

SANATORIUM CONSTRUCTION AND COST

WHILE it has been aimed to give adequate information concerning tents and temporary living quarters, an exhaustive consideration of the subject of sanatorium construction is not within the scope of this work. These data are but complementary to Parts IX, X, and XI, in which much matter on this subject is presented. The "Handbook of the Charity Organization Society" contains several valuable plans and much important informa-

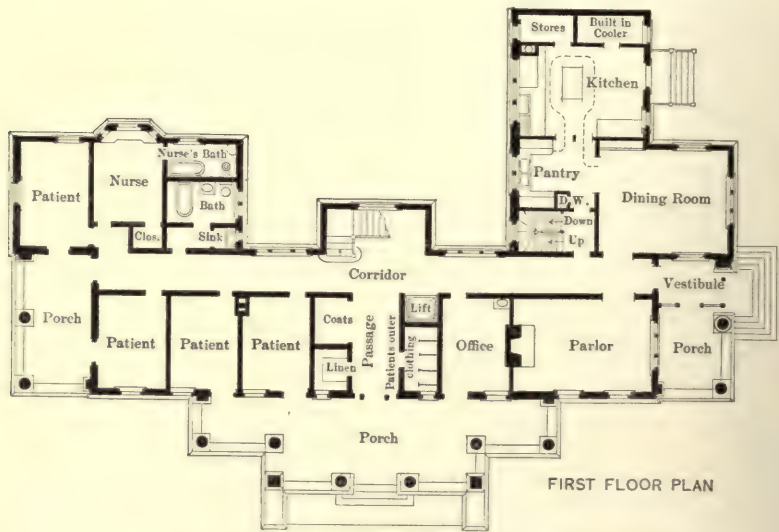


FIG. 128.—Reception Hospital at Saranac Lake (the Prescott cottage).

tion concerning sanatoria, with illustrations. In Dr. Knopf's book is to be found an excellent scheme of sanatorium construction. Other works upon this subject have been mentioned elsewhere.

The broad distinction between the American and European systems must be recalled,—the cottage plan in the former, the single structure formation in the latter.

The Reception Hospital at Saranac Lake stands on an elevation of about sixty feet above the village, faces south by east, commanding pleasant mountain and valley views in all directions. The soil is sandy, percolation is very rapid, and there is no ground-water anywhere in the vicinity. A fringe of pine- and birch-trees on the northwest acts as wind-break. This hospital, states Dr. E. R. Baldwin, who is its medical director, is of a character much needed in the vicinity of all large cities. Perhaps this building, though de-

signed for a special purpose, would serve as a model for these others. The photograph of it is introduced in this book with Dr. Baldwin's permission. The special use to which this hospital is devoted at Saranac Lake is set forth in Part IX, Chapter II.

The architects of the hospital, Messrs. Scopes & Feustmann, give this description of the building:

The plans were developed by the architects with the purpose of providing modern sanatorium accommodations for twelve acute (or advanced) and

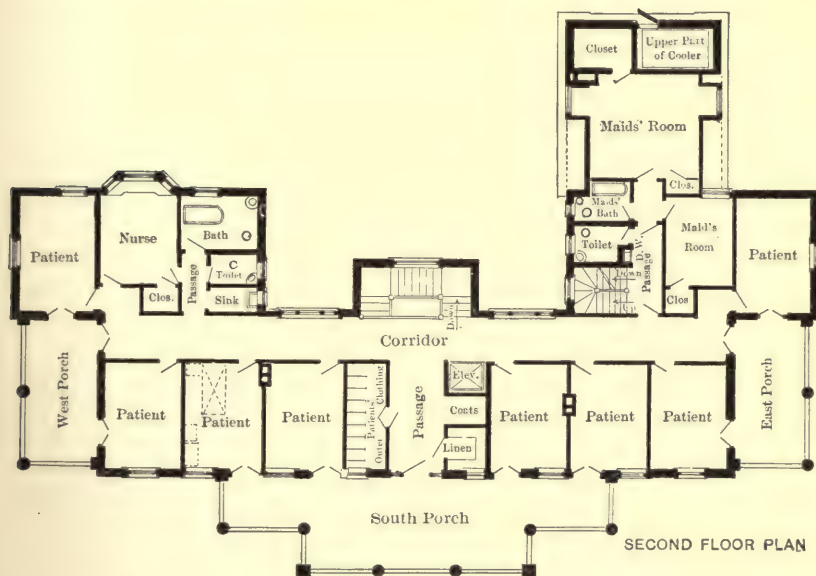


FIG. 129.—Reception Hospital at Saranac Lake (the Prescott cottage).

eight convalescing cases of tuberculosis in individual rooms. However, owing to the fact that the deficit is borne by one person, but fifteen patients will be accepted at present. The acute or advanced cases will be treated on the first and second floors in rooms ten feet by thirteen feet six inches, having two windows. Each patient has direct access to a porch by means of a combination of door and double hung window through which a bed may be wheeled. The patients in a convalescing condition may be accommodated on the third floor, and will use the lower porches for the outdoor cure. Although ample porch room is provided (one hundred square feet per patient) every effort has been made to arrange the piazzas in such a manner as to shade the patients' rooms as little as possible. To this end the porches have not been made continuous, but are placed in three sections, respectively, on the south front and in the southeast and southwest angles of the building. Furthermore, the two ends of the south porch have been recessed to introduce sunlight into such patients' rooms as would otherwise be entirely shaded by the deep porches. It should be noted that the latter blanket only

unimportant rooms. All patients' rooms have southern exposure, and by the above arrangement will receive sunlight during some portion of the day. By placing the street entrance at the extreme east end of the building, the privacy of the patients on the first floor is assured. Sliding sash are used at the exposed angles of porches as a protection from draughts.

Transoms have not been used over windows for ventilation, but all windows have been placed close to the ceiling; outside transoms are difficult to operate and are costly. However, transoms are placed over all bedroom doors to be used in connection with corridor and bedroom windows for continuous

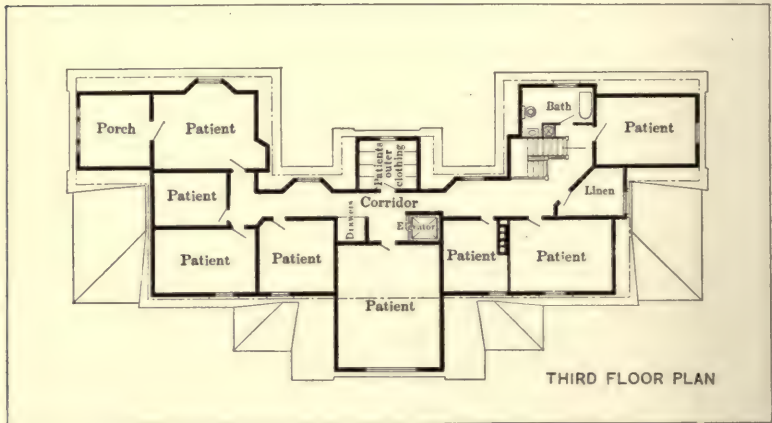


FIG. 130.—Reception Hospital at Saranac Lake (the Prescott cottage).

natural ventilation, but all openings are placed in such relation to the bed as not to expose the patient to draughts when indoors. Each corridor is in itself carefully ventilated and lighted at either end by sash doors and transoms and laterally by large windows, making possible frequent flushing with fresh air; it is hoped in this way to reduce to a minimum the annoyance from the usual hospital odors.

As the advantages of sanitary towers are largely illusory, the plumbing is placed in well-aired angles of the building and in every instance is separated by two doors from the main corridor. The heating is by a simple system of direct hot-water radiation with radiators under windows. Electric lights are provided throughout the building. Annunciators are placed in nurses' rooms and office, connecting with all patients' rooms, baths, and porches.

The walls of all bath and toilet rooms are finished with Keene's cement and painted with white enamel. For acoustic reasons all other walls are plastered with common lime mortar. All internal angles are rounded into ceilings and walls. The bases are of special design perfectly rounded against floors, which are of narrow, comb-grained Georgia pine.

Wardrobes and closets have been purposely omitted from patients' rooms; all outer clothing is cared for in ventilated locker rooms on each floor. These

rooms are provided with double doors and windows made air-tight by the use of gaskets, thus permitting frequent disinfection.

Reducing the cost of service no diet kitchens are provided on the several stories, but all diets are prepared in the large pantry next to the kitchen and distributed to the other floors by means of a dumb-waiter in the service wing. A hydraulic elevator large enough to receive a wheeled chair is provided for patients.

The exterior walls are of rough dark red brick having wide white mortar joints, bonded every fifth course with black headers. The exterior finish is of wood painted cream white. It has been considered that this treatment carried out in the spirit of the Georgian period offered the best architectural expedient for a building requiring two-storied porches.

The cost of this building complete, exclusive of furnishings, is about \$21,000. The hospital is connected to the excellent water supply and drainage

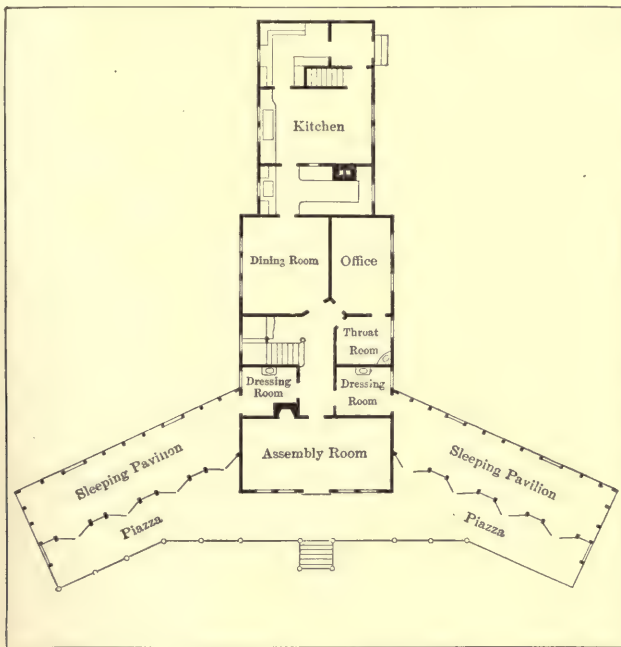


FIG. 131.—The Maine Sanatorium.

system furnished by the corporation of Saranac Lake, obviating the necessity for expensive individual water supply and sewage disposal plants.

The Maine Sanatorium at Greenwood Mountain is an example of what can be done as a starter upon modest appropriations. This structure is of two stories, of which the first floor plan is here shown.

The following is the list of wages of the Massachusetts State Sanatorium, the amounts being by the month except where stated:

Examining and visiting physicians, per annum, each...	\$1,500
Superintendent and treasurer, per annum.....	2,250
Matron and superintendent of nurses, per annum.....	1,000
Assistant physician, per annum.....	1,000
Assistant physician, per annum.....	800
Assistant physician, per annum.....	500
Chief engineer, per annum	1,100
Farmer, without living, per annum.....	800
Bookkeeper, per annum	700
Dietitian and steward	65
Nurses, day	25, 30, and 35
Nurses, night	30 and 40
Record clerk	35
Stenographer	30
Clerk's assistant	18
Supervisor, male	35
Supervisors, female	15 and 20
Engineer and fireman, without living	50 and 60
Fireman's helper	15
Cook	85
Assistant cook	45
Baker	60
Baker's assistant	15
Carpenter, without living	70
Night attendant	20
Head laundress	25
Laundry help, male	25
Laundry help, female	15 to 20
Ward help, male	10 and 15
General work, male and female	12 to 15
Storeroom man	25
Pharmacist	10
Kitchen help, male	15 to 27
Coachman	25
Teamsters	25
Farm help, without living	35
Farm help, with living	5 to 25
Mail carrier	5

The Sherwood Forest Sanatorium, in England, constructed by the Portable Building Company, of Fleetwood, is in its general plan similar to Dr. Burton Fanning's sanatorium at Maundsley. The total cost of this structure is \$26,500, or \$1100 for each bed. The outer wall of weather-boarding is separated by an air-space and by felt from the inner wall. The latter in the central block is of matched boarding, air dried, and therefore considered not shrinkable by the builders. It is well varnished and is washable. In the wards and bath rooms the matched boarding is replaced by composition boards,

a smooth material obtained in pieces four feet wide, of any length, the joints being protected by a semicircular beading, and the whole covered with several coats of petrifying liquid of pale-green color. This surface is smooth, shiny, washable with disinfectants, and presenting no dust crevices. A good smooth linoleum, which is treated with a preparation of beeswax and turpentine, covers the floors. All dust is removed by damp cloths.

The foundation of the building, which is constructed of wood, is of concrete and brick, the latter being of such a height that a man can everywhere get under the floors to attend to hot-water pipes, etc. The low pressure hot-water system, with radiators supplied from a boiler in the basement, gives the heat. There are but three fireplaces, one in the kitchen and two in the administration block. The water supply is continuous, coming through pipes from the Mansfield water-works half a mile away. The lighting is by electricity, which is, expense and all else considered, the most satisfactory method. Water-closets and bacterial filter-beds dispose of sewage. The main drain empties into a septic tank, after which comes another, an aerobic tank, filled with coarse clinkers, through which lateral filtration occurs. From this the sewage flows over a Stoddart distributor to a continuous filtration or percolator bed of fine clinkers, heaped up without retaining walls. The final effluent goes to a grass-field, which it is hoped to use as a kitchen-garden. Storm-water is diverted from the septic tank by an overflow side pipe, which leads directly to another portion of this field.

The sanatorium plan devised by Dr. Arthur Latham and his associate, Mr. A. William West, is on the separate block system. The buildings, connected by covered ways, will be arranged, site permitting, in the form of a crescent. There will be an administration block, with dining and other accommodations; one for thirty-six, more or less, convalescent male patients; one for the same number of women in like condition; one for sixteen patients who, for various reasons, are confined to their own rooms for the greater part of the day; one for twelve patients with more ample means; and a block for engine-house, laundry, disinfecting station, and research laboratories, together with a meteorological observatory, a mortuary, a post-mortem room, and other necessary accommodations. The outside of the buildings will be made as attractive as possible. They will all be two stories high. The rooms are placed on one side of a corridor which has windows on the opposite side. There will be precautions against fire and voice conduction; to have the buildings dry; and to insure privacy. The construction will be of concrete and steel girders, the partitions being made of cement. All angles will be rounded off, and there will be no mouldings or projecting architraves. The room floors and the stairs will be of teak, the walls lined in such a way that they can be readily cleaned. The ceilings will be lined with mezzotile. All windows will be casements with fanlights carried flush to the ceilings, specially fitted so as not to lodge dust, the glass will be plate, and all buildings will be so arranged that any portion may be readily isolated in case of need.

The administration block is to be placed on a slightly higher level than the other buildings, and will have a small private road leading to it. The

main aspect is southerly. In this block are placed the kitchen and dining-rooms for the greater number of patients, male and female lavatories, post-and telegraph-office, quarters for the medical staff, with laboratory for routine examinations, and rooms for special departments (X-ray, dental, throat, etc.); accommodations for secretary, matron, nurses, and servants. It is planned that the kitchen and dining-room may not ventilate into other apartments, while the rooms used by the patients are entirely cut off from the rest of the building. Only one recreation-room is provided, which may also serve the purpose of a library.

The block for thirty-six convalescent patients will contain eighteen rooms on each of the two floors. The building consists of two wings, at an angle of 45 degrees. The aspect of the rooms varies from south-southeast to south-southwest. On the ground floor the rooms are raised sufficiently to insure privacy. Behind the patients' rooms runs a corridor six feet broad, amply provided with windows, one of which is placed opposite the door of each room; and this corridor is covered with cork carpet to lessen noise. At either end is a window or a door which leads directly upon the open, and so permits free ventilation. The upper floor is connected at each end by means of a bridge, with a path on the sloping elevation immediately behind the house. In the corridors bay windows (sixteen by six feet) project so that patients confined to their rooms may utilize them in hot weather or in southerly gales. In addition there are on each end of the wing sanitary towers, completely cut off from the rooms by aerial cross ventilation, and containing lavatory, bath, and sink for housemaids' accommodation. Provision is also made for cloak-, linen-, and store-rooms, sleeping quarters for two male servants, and accommodations for two day nurses. On either floor there is, in the centre of the building, a small open-air gallery with southerly aspect, for the use of any of the patients housed here who may suffer a relapse. These open-air galleries are not essential in the case of the larger blocks, but add to their efficiency, while the sanitary towers in these blocks should be placed, whenever possible, at the end of the building. The block for thirty-six women patients is identical with that here described.

The block for sixteen patients confined to their rooms is also almost identical with the larger blocks, save that the open-air gallery is somewhat larger, and that there are day and night accommodations for two nurses, together with a small operating-room. There is to be an elevator.

The block for twelve well-to-do patients is on the same lines. It will have for each patient a sitting-room as well as a bedroom. The former will be used only when the patient is resting on a sofa-chair. Two recreation-rooms for occasional use are added on the same lines as those in the administration block. The accommodation, including an elevator for patients, is superior to that of the other blocks. Separate kitchen and dining-room, well isolated, are placed behind the building. The block for engine-house, etc., will be in all respects of modern type. The laundry and disinfecting stations will communicate. The mortuary will be placed conveniently near the road. The engine-house will be so planned that no vibration will be communicated. It will contain the necessary electrical plant, and will lodge the engineer and his

wife. Each patient's room is ten by twelve by fourteen feet. The manner of lining the walls will depend upon the funds available. It is proposed that they shall have artistic glazed tiling to the height of three and one-half feet, and then be painted with oil. For the rooms of the patients in better circumstances, washable paper will be employed. The floor will be of teak. The head of the bed must not come within one foot of the wall. The door is to be wide enough (three and one-half feet) to allow a bed to be wheeled through, and is to be placed opposite a window in the corridor. Above the door, and throughout the upper part of the northern wall, are fanlights two feet deep. The south side consists chiefly of window-space. There is a rectangular projection at the eastern (or the western, as the case may be) half of this aspect of the room (seven by four by ten feet), so arranged that it has a window looking south and smaller ones looking east and west. The use of verandas or galleries, where many patients may congregate, is objected to; and it is thus curved to afford each patient, by means of these projections, a resting-place under such conditions that, whatever the weather, he may always be able to open one or more windows, and enjoy the air. On the western (or eastern) half of the southern aspect is a window three and one-half feet wide. Above these casement windows in all cases are fanlights, the top of which is flush with the ceiling. The casement windows commence two and one-half feet from the floor. Each room will have a special piece of furniture, open at the back so that it may be thoroughly cleaned, and comprising wardrobe with sloping roof, drawers, looking-glass and washstand, in addition to the ordinary furniture. Light perforated blinds are provided for protection against sun and rain.

Except for two spare bedrooms in the block for patients with more ample means, no rooms are provided for visitors, who are best housed in neighboring cottages. Nor is there provision for church or chapel, it being held that the congregating of consumptives under cover should be avoided. Services are advised to be held in the open air. The lighting is by electricity; the ventilation almost entirely by means of open windows, with perhaps, in addition, electric fans for use in hot weather, and a small shaft with mica flap to prevent down-draught. The dining-rooms, kitchens, etc., are amply provided with electric exhaust fans. All heating and cooking is by electricity, except such heating as is required for warm baths, laundry purposes, or steam disinfection. This latter will be provided by upright boilers using coke, and supplied with efficient smoke-consumers. The electricity will be generated by means of water-power, gas, or oil, according to the possibilities of the site. With regard to drainage, the laying out of the grounds and many other details, the reader must be referred to the important work of Dr. Latham and his learned associate, which is illustrated by many valuable and suggestive diagrams.

APPENDIX G

SANATORIUM AND DISPENSARY RULES AND REGULATIONS; SCHEDULES,
CIRCULARS, ETC.

EVERY one upon entering the Massachusetts State Sanatorium, at Rutland, subscribes to the following regulations:

Patients must spend as much time as possible out of doors every day. They must be out of the wards before nine A.M.

Patients upon admission must not leave the building until they have received instructions from their physician regarding exercising. They are expected to follow the advice of the physician regarding dress, exercise, and diet. As food forms an important part of the treatment, patients are urged to take as much nourishment as possible. Food should be taken as a duty even when there is no desire to eat.

Eating between meals and lunches is prohibited.

Patients must be present at all meals and lunches, unless excused by the superintendent or matron.

Patients must respond promptly to the first bell for meals. This allows time for a thorough cleansing of the hands before the patient enters the dining-room. This regulation is very important and must not be neglected.

Stimulants are not allowed except under medical advice. Drinking of liquor (beer, ale, hard cider, sherry, etc., as well as the stronger alcoholic beverages) on the sanatorium grounds or elsewhere will be punished by dismissal.

Patients are required to use for expectoration at all times the cuspidors provided for that purpose. Under no circumstances should handkerchiefs be used, and spitting upon the grounds, floors, or into basins, closets, and sinks is absolutely prohibited. For the health of all concerned this rule will be strictly enforced.

Patients must be in bed before 9.30 P.M., at which time the lights are turned off. After that time absolute quiet must prevail in the wards.

Any patient not excused, for physical reasons, who is found in bed fifteen minutes after the rising bell rings, disobeys a rule. Patients are not allowed to get up earlier than half an hour before the rising bell rings, without permission from the nurse, lest they disturb others in the ward. Do not forget that others may need more sleep than you require.

Association of men and women on or off the grounds is not allowed except by permission.

Visiting days are Tuesdays and Saturdays. All visitors must enter at the main entrance and register before seeing their friends. Entering at the ward doors is not allowed.

Patients will be responsible for any damage done to the property of the institution. Charges for breakage and repairs will be made on the monthly account.

Under no circumstances are fires to be lighted in the woods, or elsewhere on the grounds, without permission.

Bathing in the lake is prohibited.

Cutting of boughs and shrubbery, peeling the bark from the trees, or otherwise mutilating the wood-land, is prohibited, and the patients are individually requested to do all in their power to preserve the trees, wild flowers, etc.

The time between 1 and 3 P.M. daily, must be observed as a "quiet hour" in the wards. At this time all talking, passing through the ward, or any other disturbing noises, must be avoided.

Bundles for the laundry must be ready Tuesday evening.

Patients are required to do some regular daily work unless excused by their physician.

Women patients are allowed to go into that portion of the woods only which is directly in the rear of Wards C and D. They must not use the woods-path to the village without permission.

Blankets next to the body in sleeping are not allowed.

If patients become sufficiently ill during the day to go to bed they must at once report to the nurse, who will arrange for necessary treatment.

Packages sent by express or otherwise to patients must be inspected by the authorities. Patients are not allowed to receive express packages at the stations. Any articles of food or drink (with the exception of fresh fruit) should be returned to the sender.

Conversation between patients regarding their symptoms, or any subject relating to illness, should be strenuously avoided at all times.

Patients are required to observe Sunday as a day of quiet, when games, driving, and other week-day sports are not allowed.

Patients are not allowed to go off the sanatorium grounds after supper without permission.

Women patients are not allowed to go to any of the stations without permission.

Patients are not allowed to congregate in mass meeting for any purpose, or to build "camps" without first receiving permission from the superintendent.

All windows are to be opened and closed by the nurse or attendant only.

Use of profane or obscene language about the institution or grounds will not be tolerated.

Any complaint against the institution, or another patient, must be made to the superintendent.

No smoking is allowed except by permission. The smoking of cigarettes is prohibited. Patients are not allowed to smoke in any of the buildings or on any of the piazzas.

Patients are not allowed to attend church services or any other gathering away from the sanatorium without special permission. They are not allowed to visit in the neighboring houses. The daily life must be spent out of doors.

Patients will not be allowed to leave the institution temporarily except for very urgent reasons, and then only for a limited stay, and after obtaining permission from the superintendent. At such times they must provide their own conveyance to and from the station and pay for board and treatment during their absence.

Patients are required to give the superintendent three days' notice before departure, and to pay for board for that time.

Baggage must be ready at 7 A.M. Patients going at any other than the regular times must provide their own conveyance.

In addition to the above rules the patient is required to follow any other regulations that are made from time to time and are posted upon the bulletin boards.

A careful, regular life is required of all, and for any violation of the rules or for obnoxious conduct about the institution, on the grounds, along the road-ways, in the village, or elsewhere, the patient may be punished by dismissal.

All patients are expected to follow the advice of the attending physician regarding the length of their stay in the institution.

Suggestions to patients leaving the tuberculosis infirmary of the Metropolitan Hospital, New York City, adopted by the Commissioner of Public Charities, October, 1902:

During your stay in this hospital you have been surrounded by conditions favorable to recovery or improvement, some of which cannot easily be continued in your home. It is therefore of the greatest importance that you should take pains to continue these favorable conditions as far as possible, not only for your own sake but for the sake of your family, your friends, and your associates. These suggestions are earnestly commended to you, all of them based upon a desire to prevent needless disease and suffering:

SPITTING.—All expectoration contains germs. When there is throat, bronchial, or lung trouble, these germs are dangerous, and it is a plain duty to destroy these germs before they can do harm. Unless the expectoration is carefully gathered and destroyed it will surely be the means of spreading disease to others. Therefore, you should never be without a pocket flask for expectoration, to be used when you cannot conveniently get to a stationary spittoon, partially filled with carbolic acid and water (5 per cent. solution). Never spit in public places, on the floor of street-cars or trains, on the street or sidewalk, or on the floor or walls of public or private buildings. Do not spit into your handkerchief, but if you have no flask use a small piece of cloth or soft paper to spit into. Do not put these soiled rags or paper into your pocket, but collect them in a paper bag and burn the bag and all when you have a chance. Do not swallow what you cough up. Never kiss any person on the mouth. By caring for the expectorated matter as above indicated you protect yourself from taking the same germs into your system again, either by inhaling dust containing particles of dried sputum or by infecting yourself through sores.

COUGHING.—Try not to cough. When you must cough, hold a piece of cloth in front of your mouth, so that particles will not fly out into the room.

FRESH AIR.—Be out in the fresh air as much as possible. If you cannot have work out of doors, go to the house door or to an open window and take three to nine full breaths, according to your strength. Do this at least six

or eight times a day, and do it every half hour, if possible. Do not work in a dusty place. Avoid overexertion, physically as well as mentally. Get in the sunshine as often as you can. Avoid crowded rooms where the air is close and dusty, and where there is much smoking.

DRESS.—Dress yourself comfortably,—lightly in summer, warmly in winter, but not too heavily, so as to hinder your movements or produce sweating.

SLEEP.—Sleep in a clean, well-aired room, with windows open, and go to bed early. Night air is as good as day air. Do not sleep with another person, and, if possible, have a separate bedroom.

FOOD.—Eat plain, simple food (eggs, meat, bread, oatmeal, macaroni, rice, vegetables, milk, cream, and butter). If possible, have some hot milk before you get up in the morning and at bedtime. During the day drink plenty of pure water. Spend your money for good food. Do not use patent medicines, but consult a doctor when you are ill. Do not drink whiskey, rum, gin, or brandy. Do not smoke.

BATHING.—Keep clean. Take a cold sponge-bath each morning. Rub the skin well with a coarse towel. Take a warm soap-bath once a week.

Be hopeful and cheerful. Do not talk about your disease to any one except your doctor.

Rules for patients of the Henry Phipps Institution for the Study, Treatment, and Prevention of Tuberculosis:

Don't spit on the pavement, on the street, nor into any place where you cannot destroy the germs which you spit up,

Do not swallow any spit which comes up from the lungs or which comes out of the back part of your throat.

Spit into a spit-cup when it is possible to do so.

Always use a spit-cup with a handle to it, so that you can hold it close to your mouth.

When you use a china or earthenware spit-cup, always keep lye and water in it and scald out the spit-cup once or twice a day with boiling water.

When you use a tin spit-cup with a paper spit-cup inside burn the paper cup at least once a day and scald the tin cup with boiling water.

Never use a handkerchief or a rag or any material other than paper to spit in or to wipe your mouth with.

When you cannot spit into a spit-cup, spit into a paper napkin.

Always use a paper napkin to wipe your mouth with after spitting, and be careful not to soil your hands.

Always carry a cheap paper bag in your pocket or saba to put paper napkins in which you have used.

When you have used a paper napkin, either to spit in or to wipe your mouth with, fold it up carefully and put it away in a paper bag.

Every evening, before going to bed, burn your paper bag together with the napkins which you have deposited in it.

Do not let any spit get on your clothing, or your lips and hands, or your bedclothes or carpets or furniture, or on anything about you, wherever you may be.

If, by accident, any spit should be deposited anywhere else than in your spit-cup or in your paper napkin, take pains at once to destroy it, either by taking it up and putting it into the fire or by putting lye and water on it.

If you have a moustache or beard shave it off or crop it close.

Always wash your lips and hands before eating or drinking, and rinse out your mouth.

If you have a running sore take up the matter which is given off with absorbent cotton and burn it.

Avoid handshaking and kissing. These customs are dangerous to you as well as to others. They may give others consumption; they may bring you colds and influenzas which will greatly aggravate your disease and may prevent your recovery.

Do not cough if you can help it. You can control your cough to a great extent by will power. When you cough severely hold a paper napkin to your mouth so as not to throw out spit while coughing.

Sit out of doors all you can. If you have no other place to sit than the pavement sit on the pavement in front of your house.

Don't take any exercise except upon the advice of your doctor.

Always sleep with your windows open, no matter what the weather may be.

Avoid fatigue. One single fatigue may change the course of your disease from a favorable one to an unfavorable one.

Go to bed early. If you are working, lie down when you have a few moments to spare.

Don't take any medicine unless it has been prescribed by your physician. Medicine may do you harm as well as good. Don't use alcoholic stimulants of any kind. Don't eat pastry or dainties. They do not nourish and they may upset your stomach. Take your milk and raw eggs whether you feel like it or not.

Keep up your courage. Make a brave fight for your life. Do what you are told to do as though your recovery depended upon the carrying out of every little detail.

Always keep in mind that consumption can be cured in many cases, and that it can be prevented in all cases.

If your own disease is too far advanced for you to recover, console yourself with the idea that you can keep those who are near and dear to you from getting it.

Circular issued by the Committee on the Prevention of Consumption of the United Garment Workers of America in conjunction with the Committee on the Prevention of Tuberculosis of the Charity Organization Society of New York City:

Don't give consumption to others; don't let others give it to you.

The spit and the small particles coughed up and sneezed out by consumptives, and by many who do not know that they have consumption, are full of living germs too small to be seen. These germs are the cause, and the only cause, of consumption.

Don't spit on sidewalks—it spreads disease and it is against the law. Don't spit on the floor of your home. Don't spit on the floor of your shop. When you spit, spit into the gutters or into a spittoon. Have spittoons half full of water, and clean them out at least once a day with hot water.

Don't cough without holding a handkerchief or your hand over your mouth.

Don't work in rooms where there is no fresh air; don't live in rooms where there is no fresh air; don't sleep in rooms where there is no fresh air; keep at least one window open in your bedroom; fresh air helps to kill the consumption germ; fresh air helps to keep you strong and healthy.

Don't neglect a cold or a cough.

If you have consumption because you or others have not followed these rules: go to a doctor or a dispensary. If you take steps in time you can be cured; if you wait until you are so sick that you can't work any longer, or until you are very weak, it may be too late; and anyway, it will, in the end, mean more time out of work and more wages lost than if you had taken care of yourself at the start.

Don't spend your money on advertised cures—they are useless.

Don't drink whiskey, beer, or other intoxicating drinks; if you do, it will make it all the harder for you to get well.

Don't sleep in the same bed, and, if possible, not in the same room, with any one else.

Don't let others use the same knives and forks, plates, and cups that you use; have your own set.

Good food, and plenty of it; fresh air and rest, and plenty of both, are the best cures. Keep in the sunshine as much as possible, and keep your windows open winter and summer, night and day. The fresh air, night and day, is good for you; but don't go out at night.

Go to a hospital when you can and before it is too late. There you can get the best treatment, all the fresh air, all the food, and all the rest which you need.

The careful and clean consumptive is not dangerous to those with whom he lives and works.

[This advice is followed by a list of dispensaries in which consumptives may be treated without charge.]

A circular issued by the Charity Organization Society of New York City:

WARFARE AGAINST CONSUMPTION—WHY FIGHT IT?

Because more people die of consumption than from any other disease. Each year 1,095,000 of the people of the world die of it. In the United States over 100,000 die every year of consumption. Every day 3000, and each minute of the day two persons fall before this enemy. How many of your friends have died of it?

Because it is a disease which spreads from one person to another, and any one may catch it.

Because it is chiefly caused by the filthy habit of spitting.

Because it is a disease which can be stopped, and need not spread.

Because every one may and should help stop it.

Because already there is change for the better. The number of deaths from consumption is growing less. Twenty years ago there were many more deaths in proportion to the population than now.

If the tuberculosis death-rate of 1886 had been maintained the first nine months of 1902, four thousand more persons in Manhattan and the Bronx would have died of tuberculosis than actually died in these months.

Could anything be found more inspiring, more plainly indicative of the need for extending the work against this disease?

HOW FIGHT IT?

By remembering these five points about the enemy:

(1) People are seldom born with consumption.

(2) It is caused by a very small living thing whose name is "bacillus tuberculosis."

(3) This living thing comes from the sick person through the spit. Sometimes millions are coughed up and spit out in a single day by one consumptive person.

(4) This spit may dry, and the germs mix with the dust, float in the air, and settle on the walls or in the carpets.

(5) They are then breathed in and settle in the throat and lungs, causing consumption of those parts.

By remembering these five points about the body:

(1) Your body can resist these germs, so that they will not spread and cause consumption.

(2) If your body is weak it may not be able to resist them.

(3) Your body may become weakened. How? By strong drink, which is one of the best helpers the germs have; by other forms of dissipation; by too little food, air, and light; by la grippe, typhoid fever, pneumonia, bronchitis, and sometimes a simple cold.

(4) Keep your body strong, so that you can resist the germs. How? Be in the open air as much as possible; drink plenty of pure water; keep early hours; sleep eight hours out of the twenty-four; live as regular a life as possible; eat plain, good food; see that the bowels move freely every day; consult a doctor if you have a cough, or are run down, or if you cannot stand as much work as you could formerly.

(5) Do not spit yourself or allow your consumptive friends to spit on the floor, carpet, stove, wall, or street, or anywhere except in a cup or spittoon for that purpose. This cup should contain water so that the matter will not dry. When not at home, or in a place where a spittoon cannot be used, carry little pieces of tissue paper, and after use burn them.

Tell your friends that consumption is one of the oftenest cured of all chronic diseases, and can be cured in nearly all cases, but it must be taken very early. Are you interested? If you wish to read more on this important matter, write to the Charity Organization Society, 105 East Twenty-second Street, New York, for information.

Schedule for recording the social history of consumption, prepared by the
Charity Organization Society of New York City:

Personal Description.

- a. Sex.
- b. Date of birth.
- c. Color.
- d. Nationality.
- e. Birthplace of mother.
- f. Length of residence.
 1. In the United States.
 2. In New York City.
- g. City-bred or country-bred?

Family Relations.

- a. Single, married, widowed, or divorced?
- b. Did father have a strong constitution?
Did mother?
- c. Did father drink?
- d. Did mother drink?
- e. Members of family or household.

	Sex.	Date of Birth.	Relationship to Patient.
1			
2			
3			
4			
5			
6			
7			
8			

History of Illness.

- a. How long has patient been ill?
- b. Health before consumption appeared.
 1. Was constitution strong or weak?
 2. Was digestion naturally good, indifferent, or poor?
 3. Was patient well nourished?
- c. Stage of the disease reached at present.
- d. Account of treatment received, with results.
 1. Patent medicines.
 2. Private physicians.
 3. Dispensaries.
 4. Hospitals and sanatoria.

Record for Dependency.

- a.* Has patient ever been an inmate of a charitable institution, public or private?

If so,

1. When?
2. Where?
3. For how long?

- b.* Has patient ever applied for aid to a charitable society or individual?

Has Patient ever been an Inmate of a Correctional or Penal Institution?

If so,

- a.* When?
- b.* Where?
- c.* For how long?
- d.* For what offence?

Dissipation.

- a.* Was patient an occasional, a moderate, or a "hard" drinker?
- b.* Had intemperance injured the constitution?
- c.* Other forms of dissipation.

Education.

- a.* General: none, poor, fair, good, or excellent?
- b.* Did patient ever receive instruction in physiology and hygiene?

Other Information not Covered by Schedule Inquiries.

(Signed)

APPENDIX H

RESULTS OF TREATMENT IN VARIOUS INSTITUTIONS, AND OTHER RELATIVE INFORMATION

DR. LAWRASON BROWN and E. S. Pope have tabulated the results obtained at the Saranac Lake Sanatorium. They consider that the real test of institutional treatment consists not in the immediate but in the ultimate results. The lack of uniformity and classification which has characterized reports (and which it is hoped will be obviated by the adoption of the Turban scheme) renders the comparison or the combination of results of various sanatoria very difficult. The classification on the "ability to work" is beset by so many difficulties in America that it is of very little value. Americans vary much in this regard. It is found, therefore, that the mortality among patients discharged in various conditions affords the best methods of studying the permanent results of sanatorium treatment. Of those discharged from Saranac apparently cured, 93 per cent. of the expected living are alive; of the disease arrested, 65 per cent.; of the cases discharged with active symptoms, 23 per cent. The death-rate among the apparently cured patients during the first ten years is about three times the ordinary death-rate. The death-rate among patients discharged with the disease arrested increases during the first

few years to many (ten to fifteen) times the normal death-rate, but afterwards decreases. Nearly half of the patients discharged with an active disease died in the first two years. Patients between the ages of thirty and forty, when discharged apparently cured, seem to relapse less than younger patients. This tendency is little, if at all, marked among the patients discharged with the disease arrested. Incipient cases seem to relapse less than advanced, when both were discharged in the same condition.

Dr. Trudeau makes the following definitions:

Incipient.—Cases in which both the physical and rational signs point to but slight local and constitutional involvement.

Advanced.—Cases in which the localized disease process is either extensive or in an advanced stage, or where, with a comparatively slight amount of pulmonary involvement, the rational signs point to grave constitutional impairment or to some complication.

Far Advanced.—Cases in which both the rational and physical signs warrant the term.

Apparently Cured.—Cases in which the rational signs of phthisis and the bacilli in the expectoration have been absent for at least three months or who have no expectoration at all; any abnormal physical signs remaining being interpreted as indicative of a healed lesion.

Arrested.—Cases in which cough, expectoration, and bacilli are still present, but in which all constitutional disturbance has disappeared for several months; the physical signs being interpreted as indicative of a retrogressive or arrested process.

Dr. Bowditch would restrict the term "cured" to those cases that have remained well some time after their discharge from the sanatorium, and who are living under the conditions to which they have been accustomed. The term "arrested" should be applied to those cases in which abnormal symptoms have ceased. The subsequent history, he finds, will often justify the more favorable term. He reports the results at the Rutland and Sharon sanatoria, with which he is connected, to show that fifty per cent. of those admitted are discharged with the disease arrested, or, as it is sometimes called, "apparently cured." A very large proportion of those who are supposed to be in the early stages of the disease are by no means incipient cases. If these are taken alone, from 70 to 80 per cent. will leave with the disease arrested. The Massachusetts State Sanatorium at Rutland will accept only incipient cases, which show slight changes in percussion note or respiratory murmur, with or without râles in one or both apices, the general condition being good, little or no fever, and an absence of laryngeal or marked digestive symptoms. Less favorable cases, but such as are still suitable for treatment, are those showing only slight changes of temperature, some impairment of general strength, dulness over one or both apices, and râles,—sometimes even with cavity formation if a dry condition seems to prevail. There should be absence of all laryngeal symptoms or of marked digestive disturbances. Unfavorable cases are those with marked digestive and laryngeal symptoms,

with fluctuation of temperature, hectic flushes, night-sweats, great loss of flesh, occasional diarrhœa, and general malaise,—even when accompanied by comparatively few abnormal signs in the lungs. These form the majority of the rejected cases, having been sent as incipient because of the lack of abnormal signs in the lungs alone, regardless of other more important factors. Drs. Bowditch and Clapp report concerning this institution :

Whole number of patients discharged from our service.....	576
Number who remained less than one month, and whose cases are therefore not considered	92
Number taken into consideration in our report	484

It should be stated that those who remained less than one month were discharged for a variety of reasons. The majority of them were doubtful cases as regards prognosis, and taken on trial for three weeks only, and who showed not sufficient improvement to warrant a longer stay; others were discharged on account of discontent, or for unwillingness to obey the rules; and a number were cases of suspected tuberculosis only, who failed upon closer examination to show definite signs of disease.

TABLE OF RESULTS.

Per cent.	Result.	Incipient.	Advanced.*	Totals.
48.97+	“Arrested” and “apparently cured”	189	48	237
43.00+	“Improved” (including all shades of improvement)	67	143	210
7.90+	“Not improved” (including one death)	5	32	37
	Totals	261	223	484

*Including all stages of well-marked disease except far advanced.

It will be noticed that the terms “apparently cured” and “arrested” are used together. This has been done through mutual concession as to which term best expresses the condition of patients who at the time of discharge show an entire cessation of active symptoms, such as cough, sputa containing bacilli, and fever, and whose bodily condition is such as to warrant a return to ordinary conditions of life, with reasonable hope of a permanent cure. Many of these cases by their general appearance and condition would seem to justify the more absolute term “cured,” “but it is our policy not to use this term until a reasonable length of time has elapsed after the patient’s discharge.”

Of the incipient cases 72.6 per cent. were “arrested” or “apparently cured.” Of the 484 patients, the average length of stay was 2 days short of 6 months. Of the 484 patients, the number who gained weight was..... 464
 Average gain in weight of these was (pounds)14½
 Of the 484 patients, the number who lost weight was..... 20
 Average loss of weight of these was (pounds)..... 5½

COMPARISON OF PERCENTAGES IN FIRST, SECOND, THIRD, FOURTH, AND FIFTH YEARS.

	1898-99.	1899-1900.	1900-01.	1901-02.	1902-03.
Per cent. of "arrested" and "apparently cured" cases	34.28+	42.35	46.12	48.31	48.97
Per cent. of all classes of "improved" cases	39.36+	44.70	47.64	44.51+	43.00+
Per cent. of "not improved" cases	26.04+	12.95	5.74	6.73+	7.90+

PERCENTAGE OF INCIPIENT CASES ARRESTED OR APPARENTLY CURED.

	1898-99.	1899-1900.	1900-01.	1901-02.	1902-03.
"Arrested" or "apparently cured"	64.60	72.90	73.00	72.00	72.60

It will be noted in the above tables that, even allowing for the inevitable fluctuations from year to year of such statistics, the number of "arrested" or "apparently cured" cases has steadily increased.

The large majority of those who were discharged from the sanatorium as "arrested" or "apparently cured" in the years preceding this are well, and are actively at work. Many of these have recently had personal examinations by the physicians.

"Almost without exception we have learned that those in whom a relapse occurred had resumed former unhealthy occupations, or had returned to unhygienic homes on leaving the sanatorium, which facts alone are sufficient to account for recurrences of the disease."

The patients in the Tuberculosis Infirmary on Blackwell's Island are divided into four classes: (a) In the incipient stage; (b) cases showing fever, cough, night-sweats, and bacilli in the sputum, but retaining a fair amount of strength and bodily nutrition,—moderately hopeful; (c) cases with all symptoms clearly developed, but whose general condition was less favorable than in the preceding class, though they were still able to be up a portion or the whole of each day; (d) patients in the last stage of the disease.

The following instructions are sent to examiners of applicants for the New York State Hospital for Incipient Tuberculosis at Ray Brook:

The difficulty in preparing an exact or comprehensive definition of incipient tuberculosis is appreciated. The term incipient is used in a clinical sense, and is meant to designate the favorable early case. Many early cases are obviously unpromising. While the success of sanatorium treatment depends largely upon an early diagnosis, the importance of prognosis must be considered in making an intelligent selection of patients. The recognition of a favorable or an unfavorable case depends upon a careful study of many

factors separately and combined. The salient points to be observed in reaching a conclusion are briefly presented:

Heredity.—Tuberculosis in any form in one or both parents. Whether before or after birth of patient. Tuberculosis in one or more brothers or sisters. Duration and character of the disease as indicative of tendency and resistance.

History.—Duration of illness and subjective symptoms, particularly cough, fever, hemorrhage, disturbance of nutrition, and loss of weight.

Previous health and preceding disease, as pneumonia, pleurisy, anæmia, chlorosis, symptoms of suspected malarial chills, etc. Complicating diseases, as syphilis, cardiac or renal disease, laryngeal tuberculosis.

Habits.—Special employment outdoor or indoor. Environment with reference to expected improvement by change. Effect of rest in ameliorating symptoms.

Age, most favorable between fifteen and forty-five. Menses, if absent more than two months. Weight in relation to height and loss of weight. Race and color.

Presence of bacillus tuberculosis.—While necessary for an absolute diagnosis, it is often needless to wait for their appearance if the signs and symptoms offer satisfactory proof of the existence of tuberculosis.

The fact is emphasized that the disease can frequently be recognized weeks or months before the bacilli are detected. If in rare instances a mistake in diagnosis should occur, benefit instead of dangerous delay is to be preferred.

Tuberculin-test.—The cases are rare in which a diagnosis cannot be made without employing this test. It is only advisable or necessary in exceptional instances, provided the examiner is qualified by training and experience. When used scientifically its diagnostic value is recognized, but errors are possible, particularly if improper methods and imperfect products are tried.

Location, extent, and character of lesion.—Most favorable when limited to a part of the lung, especially the apex or part of one lobe.

Localized and not diffuse.—Stage of infiltration with slight consolidation and slight or no destructive changes. Cavity formation and large area of consolidation due to pneumonia in any form or pleurisy with fluid or adhesions much less favorable.

Physical signs.—Only those found in the stage of infiltration mentioned. Examination includes spaces above the clavicles. Relative or slight dulness often characterized alone by elevation of pitch.

Increased vocal fremitus.—Diminished breath sounds or cog-wheel respiration, prolonged expiratory sound with elevation of pitch.

Increased vocal resonance and elevation of pitch are often best obtained by transmission of whisper. Fine bronchial râles with localized bronchitis and clicks and râles when destructive process has begun. These may appear or disappear with deep breathing or cough. The search for more than one focus of disease is extremely important. Any classification by stages based upon anatomical lesions will be deceptive unless the general condition of the patient and the symptoms are considered.

Symptoms in relation to prognosis.—Although difficult, the clinician will endeavor to differentiate between tuberculosis and phthisis. The disease can be detected before cachexia is apparent. Tuberculosis with and without mixed infection are very different conditions. The relation between the extent of lesion and the general disturbance is of paramount importance. The evidence of toxæmia may be out of all proportion to the extent of invasion of the lung. Determine if the disease is in the stage of arrest, quiescent, acute, chronic, or progressive. As a rule, patients are not in a favorable condition for transportation if the following symptoms are present: Persistent afternoon temperature of more than 100° F. Rapid pulse and respiration increased upon slight exertion. Loss of appetite and disordered nutrition, with loss of weight, diarrhœa, chills, and sweats. Repeated or large hemorrhages. When evidence of active disease is manifest and symptoms are forbidding, delay and a period of rest may change the aspect and suitability of the case for distant removal.

Finally, when the diagnosis of tuberculosis is difficult, the case is apt to be promising, and when the diagnosis is easy it is apt to be unpromising. After a place is provided for poor patients suffering from an incipient form of the disease, the prompt recognition serves some purpose and becomes imperative. The purpose of the State in creating a hospital for incipient tuberculosis is to promote an early diagnosis, offer a limited opportunity for the treatment of curable cases, and encourage prevention by removing the patient from his surroundings before he becomes a source of danger or begets progeny. The attempt to care for a few of the vast number of consumptives in this State is to an extent experimental. Every hopeless case will deprive a promising one of his only chance. The success of the institution and the project of State care must be established by statistical proof of the highest possible percentage of recoveries.

Later cards and charts to be used in recording the results of examinations, and any other information, will be furnished on application to John H. Pryor, M.D., superintendent.

Dr. Elliott, at the Muskoka Sanatorium, concludes that 75 per cent. or over of incipient cases may be cured, while of advanced cases we may look for less than 15 per cent. of cures, and of far advanced cases barely 1 per cent.

Dr. Charles O. Parfitt, physician in charge of the Free Hospital for Consumptives, at Muskoka, Canada, reports that the real aim of the institution—to cure incipient pulmonary tuberculosis—has had to be made subservient to the real needs of the public. Many cases have been cared for more advanced than the class which would come under this heading,—in fact, some 75 per cent. of those admitted. The results, therefore, must be considered not in a general percentage, but in reference to these conditions. Of cases remaining longer than a month, only 18 per cent. of those classified as advanced were arrested, though an additional 30 per cent. were very much improved; whereas, of the incipient cases 82 per cent. were apparently cured

or arrested. A great number of hopelessly advanced cases were accepted during the winter only for humane reasons. A number have been assigned to the hospital without any previous application for admission, and it has seemed impossible to turn them away. Some have stayed until they died.

Dr. Parfitt feels that the responsibility for the large number of far-advanced cases which have been received rests largely with the family physician, although he recognizes the likelihood that a case which will progress toward recovery should form the basis on which patients are admitted rather than priority of application. If this basis were adopted a greater number would pass through the hospital with benefit quickly obtained, and the institution's usefulness would be increased. Both Dr. Elliott and Dr. Parfitt employ Dr. Trudeau's definitions of terms in their report.

Only incipient cases—and such as present a fair prospect of recovery—are received at the Silver City Sanatorium. Cases of persistently high temperature and uncontrollable pulse, or other symptoms of a progressively fatal nature, are excluded. Among a representative total of 49 cases, 12 were febrile and 37 afebrile. Of the former none were cured, 25 per cent. died, 58 per cent. were discharged unimproved, and 17 per cent. were discharged improved, although in them the ultimate outlook was not favorable. Of the afebrile cases none died, 19 per cent. were discharged unimproved, 46 per cent. were improved, and 35 per cent. were clinically cured. The total results were,—6 per cent. died, 28 per cent. were unimproved, 38 per cent. were improved, and 28 per cent. were cured.

In considering results of treatment at Fort Stanton, New Mexico, it must be taken into account that cases in all stages, no matter how complicated, are received. Dr. Carrington considers as in the first stage those patients in whom the disease has not progressed to lung consolidation. The second- and third-stage cases are those in which the physical signs indicate consolidation, with or without cavities. These two stages are grouped together because it is generally difficult, if not impossible, to detect the passing from one to the other. The number of recoveries and the amount of improvement decrease, of course, according to the degree to which the disease has advanced on application for admission.

In three and a half years there were 51 cures among 470 treated. Among this total, 79 had the disease in its first stage. Among these 2 died, 4 were discharged not improved, 23 were discharged improved, 28 were discharged apparently cured, and 22 were under treatment April 30, 1903. In neither of these fatal cases was death due to tuberculosis. Among the 391 second- and third-stage cases 87 died, 16 were discharged not improved, 139 were discharged improved, 23 were discharged apparently cured, and 126 were under treatment April 30, 1903.

It was reported that in 1902 there were treated in the open-air hospitals of Germany, at the expense of the Imperial Workman's Insurance Office, 12,187 men and 4302 women who had consumption. Of this number 78 per

cent. were so far healed that no fear was then entertained of the disease rendering them incapable of work. If cases are deducted in which, after a fortnight's treatment, it was evident that no cure could be effected, the successful cases numbered 81 per cent. It is incidentally demonstrated in this report of the German Central Committee (the figures coming from the Imperial Statistical Office) that the death-rate from tuberculosis in German towns of 15,000 and more inhabitants is steadily decreasing. The number per 10,000 who died of consumption in the five years ending in 1881 was 357.7; in 1886, 346.2; in 1891, 304.5; in 1896, 255.5, and in the five years ending 1901, 218.7.

Among the French hospitals for tuberculous children that at Ormesson reports: In 1902, 71 patients left, 44 of whom were cured, 21 improved, 2 unimproved, and 4 died later. At Villiers there were, in 1902, 210 consumptive boys. Out of the 125 discharged somewhat more than 28 per cent. were cured. In the hospital at Voisy for girls over 25 per cent. were cured in the past eight years, 35 per cent. were improved, and 11 per cent. died. It may be that the results in our hospitals devoted to this purpose are better because of the greater insistence upon fresh air, night as well as day.

APPENDIX I

A list of American societies and committees for the prevention of tuberculosis, and State commissions reported up to January 1, 1905.*

CALIFORNIA.

Southern California Antituberculosis League, Dr. F. M. Pottenger, president, 226 Bradbury Building, Los Angeles.

Tuberculosis Committee of the Medical Society of the State of California, Dr. F. M. Pottenger, secretary, 226 Bradbury Building, Los Angeles.

COLORADO.

Evangelical Lutheran Sanitarium Association of Denver, Frederick d'Amour, president; Dr. Henry G. Merz, secretary, 632 Seventeenth Street, Denver.

Jewish Consumptives Relief Society, Dr. C. D. Spivak, secretary, 1421 Court place, Denver.

CONNECTICUT.

New Haven County Antituberculosis Association, Dr. Francis Bacon, president, New Haven.

DISTRICT OF COLUMBIA.

Committee on the Prevention of Consumption of the Associated Charities, Dr. William C. Woodward, chairman, 811 G Street, N. W., Washington.

* From Dr. S. A. Knopf's article on "The Present Status of the Antituberculosis Work in the United States," *Journal American Medical Association*, February 11, 1905, by permission.

GEORGIA.

Georgia Medical Commission to Investigate the Extent of Tuberculosis in Georgia and Means of Stamping Out the Disease, Dr. Charles Hicks, chairman, Dublin.

ILLINOIS.

Committee on the Prevention of Tuberculosis of the Visiting Nurses' Association, Dr. Alice Hamilton, 79 Dearborn Street, Chicago.

Illinois State Association for the Prevention of Tuberculosis, Dr. Edmund J. James, president; Dr. Arnold C. Klebs, secretary, Chicago.

Committee on Tuberculosis of the Illinois State Medical Society, Dr. J. W. Pettit, chairman, Ottawa.

National Antituberculosis Association, incorporated in Springfield; incorporators: Dr. W. B. Metcalf, Rev. F. M. Carson, C. O. Hanford, Alderman Butterworth, W. R. McDonough, all of Chicago.

INDIANA.

Indiana Committee of Tuberculosis of the State Medical Society, Dr. J. N. Hurty, secretary, Indianapolis.

The Antituberculosis Society of Indiana, Dr. Theodore Potter, secretary, Indianapolis.

MAINE.

The Maine State Sanatorium Association, Portland.

MARYLAND.

Maryland State Commission, Dr. Marshall Langton Price, medical officer, 10 South Street, Baltimore.

The State Association for the Prevention and Relief of Tuberculosis in Maryland, Dr. H. B. Jacobs, president; Dr. Joseph S. Ames, secretary.

MASSACHUSETTS.

The Boston Association for the Relief and Control of Tuberculosis, A. M. Wilson, secretary, 6 Beacon Street, Boston.

Tuberculosis Aid and Education Association, Miss Edna A. Woolson, secretary, 277 Howard Street, Cambridge.

The Springfield Association for the Prevention of Tuberculosis, Dr. H. C. Emerson, president, Springfield.

Worcester Association for the Relief and Control of Tuberculosis, Earle Brown, secretary, Worcester.

American Invalid Aid Society, Mrs. E. W. Waite, secretary, 73 Tremont Street, Boston.

MINNESOTA.

Society for the Prevention of Tuberculosis, Dr. H. M. Bracken, Pioneer Press Building, St. Paul.

Minnesota State Commission (in regard to sanatoria), Dr. H. L. Taylor, chairman, 75 Lowry Arcade, St. Paul.

The Antituberculosis Committee of the Associated Charities of Minneapolis, Edwin D. Solenberger, secretary, 738 Boston Block, Minneapolis.

MISSOURI.

St. Louis Society for the Prevention of Tuberculosis, F. E. Eaton, president; G. A. Blickhahn, secretary; Dr. William Porter, chairman, St. Louis.

NEW HAMPSHIRE.

New Hampshire State Commission (in regard to a sanatorium), Dr. Irvin A. Watson, chairman, Concord.

New Hampshire Society for the Prevention of Consumption, Dr. O. B. Douglas, chairman, Concord.

Suncook Association for the Prevention of Tuberculosis, Suncook.

NEW JERSEY.

New Jersey State Commission (in regard to a sanatorium), Edwin A. Stevens, treasurer, 1 Newark Street, Hoboken.

Antituberculosis Committee of the Oranges, Miss Louisa R. Pierson, secretary, Orange.

NEW YORK.

Binghamton Society for the Prevention and Cure of Tuberculosis, Charles W. Fetherolf, secretary, 9 Linden Avenue, Binghamton.

Tuberculosis Committee of the Buffalo Charity Organization Society, Dr. P. W. Van Peyma, chairman; Frederick Almy, secretary, 165 Swan Street, Buffalo.

Committee on the Prevention of Tuberculosis of the New York Charity Organization Society, Paul Kennaday, secretary, 105 East Twenty-second Street, New York City.

Tuberculosis Committee of the United Hebrew Charities, Dr. Lee K. Frankel, secretary, 365 Second Avenue, New York City.

Committee on the Prevention of Consumption of the United Garment Workers of America, Henry White, chairman, Bible House, New York City.

Tuberculosis Committee of the Rochester Public Health Association, Dr. M. E. Leary, 32 South Washington Street, Rochester.

OHIO.

Ohio Society for the Prevention of Tuberculosis, Dr. C. O. Probst, secretary, State Board of Health, Columbus.

Ohio Commission, appointed by the Governor to investigate the desirability of a State Sanatorium, Dr. C. O. Probst, secretary, Columbus.

PENNSYLVANIA.

Pennsylvania Society for the Prevention of Tuberculosis, Dr. Lewis Brinton, secretary, 1423 Spruce Street, Philadelphia.

The White League, Edwin W. Perot, secretary, 1515 Arch Street, Philadelphia.
Scranton Society for the Prevention and Cure of Consumption, Dr. J. M. Wainwright, secretary and treasurer, 627 Linden Street, Scranton.

Henry Phipps Institute, Dr. Lawrence F. Flick, president, 238 Pine Street, Philadelphia.

RHODE ISLAND.

Newport Association for the Relief, Control, and Prevention of Tuberculosis, president, Robert Frame (president Newport Board of Health); secretary, Clarence C. Moore, Newport.

VERMONT.

Vermont Society for the Study and Prevention of Tuberculosis, Dr. H. E. Lewis, secretary, Burlington.

Vermont State Tuberculosis Commission, Dr. H. E. Lewis, secretary, Burlington.

WISCONSIN.

Wisconsin State Commission for the Prevention of Tuberculosis, Dr. Gustav Schmitt, 1206 Walnut Street, Milwaukee.

NATIONAL.

National Association for the Study and Prevention of Tuberculosis, Dr. E. L. Trudeau, president; Dr. William Osler, first vice-president; Dr. Hermann M. Biggs, second vice-president; Dr. H. Barton Jacobs, honorary secretary; Prof. Livingston Farrand, executive secretary; Dr. George M. Sternberg, Surgeon-General, treasurer. The board of directors is composed of twenty men from all over the States who are particularly interested in the study and prevention of tuberculosis. The following is the present composition of the board: California, Dr. Norman Bridge; Colorado, Dr. S. E. Solly; Connecticut, Dr. John C. P. Foster; Washington, D. C., Dr. George M. Sternberg; Illinois, Drs. Arnold C. Klebs and Robert H. Babcock; Indiana, Dr. J. N. Hurty; Maryland, Drs. William H. Welch, William Osler, H. B. Jacobs, and John S. Fulton; Minnesota, Dr. Henry B. Bracken; Missouri, Dr. William Porter; Massachusetts, Drs. Edward O. Otis and Vincent Y. Bowditch; New Jersey, Frederick L. Hoffman; New York, Drs. Hermann M. Biggs, S. A. Knopf, and Edward L. Trudeau and Edward T. Devine; North Carolina, Dr. Charles L. Minor; Ohio, Dr. Charles O. Probst; Pennsylvania, Drs. Lawrence F. Flick, Mazyk P. Ravenel, H. S. Anders, and Leonard Pearson; Texas, Dr. N. M. Smith and Dr. George E. Bushnell, of the United States Army Hospital, and Surgeon-General Walter Wyman, of the United States Marine Hospital; Dr. H. Barton Jacobs, secretary, 11 Mt. Vernon Place, Baltimore.

CANADA.

The Canadian Association for the Prevention of Consumption and other Forms of Tuberculosis, Rev. M. Moore, D.D., secretary, 128 Wellington Street, Ottawa.
Ontario Anticonsumption League, Rev. C. S. Eby, D.D., secretary, Toronto.

Montreal League for the Prevention of Tuberculosis, Dr. A. J. Richer, honorary secretary, 11 Bleury Street, Montreal, Quebec.

The St. Francis District League for the Prevention of Tuberculosis, Dr. E. J. Williams, honorary secretary, Sherbrooke, Quebec.

The New Brunswick Association for the Prevention and Cure of Consumption, Dr. William Bayard, St. John.

BRITISH COLUMBIA.

The British Columbia Society for the Prevention of Tuberculosis, Dr. J. C. Fagan, secretary, Victoria.

A list of American sanatoria, special hospitals, and camps for the treatment of pulmonary tuberculosis.*

ARIZONA.

- Mercy Hospital, at Phoenix; 20 beds.
 St. Mary's Hospital and Sanatorium of the Sisters of St. Joseph, at Tucson; 30 beds.
 Palm Lodge Sanatorium and Tent Colony for Incipient Tuberculosis, at Phoenix; Dr. Henry M. Stone, resident physician; 55 beds; private.

CALIFORNIA.

- Dr. J. W. Barlow's Sanatorium, at Los Angeles; 15 beds.
 Esperanza Sanatorium, the Sierra Home of the Open-Air Cure for Pulmonary Diseases, at Altadena; Dr. F. C. Melton, resident physician; private; 50 beds.
 Ranch of N. O. Nelson, at Indio; private.
 Pottenger Sanatorium for Diseases of the Lungs and Throat, at Monrovia; Dr. F. M. Pottenger, medical director; 50 beds; private.
 Trinity Settlement, at Redlands; private; Dr. Moseley, medical director.
 Ballard Pulmonary Sanatorium at Pasadena; Dr. W. H. Ballard, physician-in-chief; 25 beds; private.
 The Mentone Sanatorium, near Redlands; A. R. Schultz, manager; Dr. Fred J. Koepke, resident physician; 50 beds.
 Tents for tuberculous patients of the Mendocino State Hospital for Insane, at Talmage; Dr. E. W. Wing, superintendent.

COLORADO.

- Glockner Sanatorium, at Colorado Springs; conducted by the Sisters of Charity; medical staff; 80 beds; private.
 The Nordrach Ranch, at Colorado Springs; Dr. J. E. White, medical director; 50 beds; private.
 Emma Booth Tucker Memorial Sanatorium for Consumptives; Salvation Army Tent Colony, at Amity, Powers County; Dr. Greenard, resident physician; 100 beds; charitable.
 National Jewish Hospital for Consumptives, at Denver; Dr. Moses Collins, superintendent; 90 beds; philanthropic.
 Y. M. C. A. Health Farm, at Denver; semi-philanthropic; Dr. John Wethered, resident physician; 45 beds.
 Agnes Memorial Sanatorium, at Denver; Dr. G. W. Holden, secretary; 150 beds; semi-philanthropic.
 Home for Consumptives, at Denver; Rev. Frederick W. Oakes, superintendent; 150 beds; semi-philanthropic.
 Resthaven (home for consumptives), Park Hill Addition, Denver; Dr. I. S. Garthwaite, president; 50 beds; semi-philanthropic.
 Colorado Sanatorium, at Boulder; Dr. H. F. Rand, medical superintendent; 200 beds; private.
 Foxhall, a private home for pulmonary invalids; Dr. William N. Beggs, medical director, 133 West Colfax Avenue, Denver; private.

* By permission of Dr. S. A. Knopf and Journal American Medical Association. See also the Directory of the Charity Organization Society.

Lists of European sanatoria are to be found in the treatises of Cornet, Knopf, and Walter. The English National Association for the Prevention of Consumption also publishes a list of sanatoria (1903).

Colorado Tent Colony Sanatorium, at Bennett; Dr. W. K. Robinson, physician-in-chief; 100 beds; private.

Mrs. Lare's private sanatorium for consumptives, 4633 Bert Street, Denver; private.

Rocky Mountain Industrial Sanatorium, at Wellington Lake, Denver; Dr. A. M. Holmes, medical director; semi-philanthropic.

Ballard Sanatorium, at Pueblo; Mrs. L. B. Wright, matron; 40 beds.

Tented City, under auspices of the Jewish Consumptives' Relief Society, near Denver; philanthropic; Dr. C. D. Spivak, secretary; 12 beds.

CONNECTICUT.

Gaylord Farm Sanatorium, at Wallingford; Dr. David R. Lyman, medical superintendent; 40 beds; semi-philanthropic.

New Canaan Pulmonary Sanatorium, at New Canaan; Dr. M. J. Brooks, physician-in-charge; 30 beds; private.

Separate wards for tuberculous prisoners, at Westerfield, State Hospital for Consumptives, at Hartford; public.

State Hospital for Consumptives, at Hartford; public.

DISTRICT OF COLUMBIA.

Tuberculosis Division of Government Hospital for the Insane, at Washington; Dr. William A. White, superintendent; 70 beds.

Washington Asylum Hospital, tent wards for consumptives; Dr. D. Percy Hickling, physician; Washington; 34 beds.

DELAWARE.

Division for tuberculous patients at State Hospital for the Insane; Dr. William H. Hancker, superintendent, Farnhurst; public.

FLORIDA.

Naval Hospital; tuberculosis camp, at Pensacola; 50 beds.

HAWAII.

Honolulu Home for Incurables; Dr. A. H. Sinclair, medical superintendent; 24 beds; semi-philanthropic.

ILLINOIS.

The Alexian Brothers' Hospital, consumptives' ward, Chicago; semi-philanthropic.

St. Anne's Sanatorium for Consumptives, Forty-ninth and Thomas Streets, Chicago; Dr. A. F. Kramps, physician; Sister Superior, superintendent; 125 beds; private; and 15 free beds.

Cook County Hospital for Consumptives, at Dunning; Dr. M. S. McHugh; public; 560 beds.

Illinois Camp for the Tuberculous, near Ottawa; under the auspices of the Illinois State Medical Society; Dr. James W. Pettit, physician-in-charge; semi-philanthropic; 40 beds.

INDIANA.

St. Rochus Hospital for Consumptives, west end Main Street, Fort Wayne.

Flower Mission Pavilion, City Hospital, Indianapolis; philanthropic; Dr. P. F. Martin, superintendent; 26 beds.

Special wards for tuberculous prisoners at the State Reformatory at Indianapolis; Dr. H. C. Sharp, physician in charge.

IOWA.

Boulder Lodge Sanatorium for Tuberculosis, at Fort Dodge; Dr. John W. Kime, physician-in-chief; 20 beds; private.

KENTUCKY.

Separate wards for tuberculous prisoners at the prison hospital, at Frankfort; 20 beds.

LOUISIANA.

Dr. G. R. Tolson's private sanatorium, at Covington; private.

Separate pavilion for tuberculous patients of the State Insane Asylum, at Jackson; Dr. George A. B. Hays, superintendent; 32 beds.

MAINE.

The Maine Sanatorium, at Greenwood Mountain, near Hebron; Dr. Estes Nichols, medical director; 36 beds; semi-philanthropic.

MARYLAND.

Eudowood Sanatorium, hospital for consumptives of Maryland, near Towson; Dr. Harry P. Jarrett, resident physician; 31 beds; philanthropic.

Bay View Asylum Hospital, Baltimore; Dr. W. H. Smith, physician; Rev. L. F. Zinkham, superintendent; 250 beds; public.

Tents for tuberculous patients of the Springfield State Hospital for the Insane, at Sykesville; Dr. J. C. Clark, superintendent.

MASSACHUSETTS.

Almshouse Hospital, at Boston; public; Dr. S. F. Cox, resident physician; 60 beds.

Channing Home, 30 McLean Street, Boston; Mrs. C. P. Fennel, superintendent; 17 beds; philanthropic.

House of the Good Samaritan, 6 McLean Street, Boston; Miss F. A. Jack, superintendent; 27 beds.

Sharon Sanatorium, at Sharon; Dr. V. Y. Bowditch, physician-in-chief; 21 beds; semi-philanthropic.

Cullis Home for Consumptives, Blue Hill Avenue, Dorchester; Rev. E. D. Mallory, superintendent; 40 beds.

Free home for consumptives, 428 Quiney Street, Dorchester; Jeanette Campbell, superintendent; 30 beds; philanthropic.

The Millet Sanatorium, at East Bridgewater; Dr. C. S. Millet, physician-in-chief; 20 beds; private.

Massachusetts State Sanatorium, at Rutland; Dr. Walter J. Marclay, superintendent; public; 250 beds.

Boston Children's Hospital, tuberculosis division at Wellesley Hills; 12 beds (including surgical cases).

Private Sanatorium of Dr. David P. Butler, at Rutland.

State Hospital, at Tewkesbury; Dr. John H. Nichols, superintendent; 100 beds; public.

Holy Ghost Hospital for Incurables, at Cambridge; Sister A. M. Purcell, superintendent; 35 beds; private.

MICHIGAN.

Wayne County Hospital, at Eloise; tents for 30 tuberculous patients; public; Dr. R. H. Earle, resident physician.

MINNESOTA.

Luther Hospital, at St. Paul; Dr. H. G. Steeb, manager; 100 beds.
State Sanatorium for Consumptives, at Walker, Cass County.
Special wards for tuberculous prisoners, at State Prison at Stillwater.

MISSISSIPPI.

Special hospital for the tuberculous insane, at Jackson; Dr. T. J. Mitchell, superintendent; 40 beds.

MISSOURI.

Mount St. Rose Throat and Chest Hospital, 9200 South Broadway, St. Louis; conducted by Sisters of St. Mary; Dr. William Porter, physician; 100 beds; philanthropic.

Emergency City Hospital, No. 2, St. Louis; Dr. J. Y. Brown, resident physician; 34 beds.

NEBRASKA.

Green Gables, Lincoln; Dr. Benjamin F. Bailey, Fifty-third and South Streets; 35 beds.

NEW HAMPSHIRE.

Pembroke Sanatorium for Consumptives, at Concord; Dr. H. T. Fontaine, physician; 35 beds; private.

White Mountain Tuberculosis Sanatorium, at North Conway; Dr. S. Dryden Snow, physician; Clifton J. Bailey, superintendent; 50 beds; philanthropic.

NEW JERSEY.

Memorial Hospital, at Orange; Mary I. Chambers, superintendent; special building for tuberculous patients; 18 beds.

State Sanatorium, at Glen Gardner, Hunterdon County.

NEW MEXICO.

St. Joseph's Sanatorium, at Albuquerque; conducted by Sisters of Charity; 100 beds; private.

Chico Springs Sanatorium; Dr. H. B. Masten, medical superintendent; 25 beds; private.

St. Anthony's Sanatorium, at East Las Vegas; conducted by Sisters of Charity; 32 beds; semi-philanthropic.

The Montezuma, at Las Vegas Hot Springs; Dr. J. W. Coon, resident physician; 200 beds.

St. Vincent's Sanatorium, at Sante Fe; conducted by Sisters of Charity; 28 rooms; semi-philanthropic; Dr. J. Massey, resident physician.

Sun Mount Tent City (for lung troubles only), at Santa Fe; Dr. W. M. Popplewell, physician-in-chief; private.

St. Joseph's Sanatorium, at Silver City; Dr. E. S. Bullock, medical director; private; 50 beds.

Pines Cottages, at Silver City; T. S. Parker, proprietor; private.

The Alameda, at Las Cruces; 40 beds; private.

The Las Cruces Sanatorium, at Las Cruces; Dr. R. E. McBride, superintendent; private; 40 beds.

General hospital for soldiers of U. S. Army, at Fort Bayard; Lieut.-Col. E. T. Comegys, Deputy Surgeon-General U. S. A., physician; 300 beds.

U. S. Public Health and Marine Hospital Service Sanatorium, at Fort Stanton; Surgeon P. M. Carrington in command; 225 beds.

NEW YORK.

Montefiore Home Country Sanatorium, at Bedford Station; Dr. L. Rosenberg, superintendent; 160 beds; philanthropic.

Sanatorium Gabriels, at Gabriels, near Paul Smith's; Sister Mary of Mercy, superintendent; R. L. Strong, physician, 100 beds; Drs. S. A. Knopf and J. J. Walsh, consulting physicians; semi-philanthropic.

Stony Wold Sanatorium (for incipient tuberculosis in women and children), at Lake Kushaqua, Franklin County; Dr. H. S. Goodall, physician in charge; semi-philanthropic; 150 beds.

Loomis Sanatorium, at Liberty; Dr. Herbert M. King, physician; 100 beds; private and semi-philanthropic.

The Edgemont, at Liberty; private.

Mountain Sanatorium, at Binghamton; Miss Grace C. Wagner, superintendent; public.

State Hospital for the Insane, at Binghamton; special pavilion for the tuberculous; 100 beds.

Erie County Hospital, tuberculosis wards, at Buffalo; Dr. E. J. Gilray; 54 beds; public.

Buffalo State Hospital, at Forest Avenue, Buffalo; Dr. Arthur W. Hurd, medical superintendent; tuberculosis wards; public.

Hospital for Incipient Tuberculosis, at Rochester; Dr. G. W. Coler, physician in charge; 40 beds; semi-public.

State Hospital for Incipient Tuberculosis, at Raybrook, Franklin County; Dr. John H. Pryor, physician; five dollars per week; 120 beds.

Adirondack Cottage Sanatorium, at Saranac Lake; Dr. E. L. Trudeau, physician in charge; Dr. Lawrason Brown, resident physician; 100 beds; semi-philanthropic.

Reception Cottage, at Saranac Lake, N. Y.; Dr. E. R. Baldwin, physician; semi-philanthropic; 15 beds.

Raymond Cottage, at Saranac Lake; in charge of Mrs. Josephine R. Raymond; Dr. E. R. Baldwin, physician; 14 beds.

Rumanapp Cottage, at Saranac Lake; in charge of Miss Rumanapp; Dr. Lawrason Brown, physician; 20 beds.

Hill Crest, at Santa Clara, Franklin County; for working girls and women; Dr. Caroline M. Hengel, resident physician; 56 beds; private.

Springside Sanatorium, at Auburn; Dr. Nettie E. Jenkins, resident physician; 15 beds; private.

All Saints' Home, at Verbank, Dutchess County; pavilion for tuberculous patients; in charge of the Brothers of Nazareth; 10 beds.

Westchester County Hospital (pavilion for consumptives); Dr. Frederick Baker, house physician; 24 beds; public.

Brooklyn Home for Consumptives, 240 Kingston Avenue, Brooklyn; Dr. E. Reynolds, physician; Elizabeth A. Doyle, superintendent; 120 beds; semi-philanthropic.

Seton Hospital, at Spuyten Duyvil, New York City; Dr. B. B. Steedly, physician; 200 beds; semi-philanthropic.

St. Joseph's Hospital for Consumptives, East One Hundred and Forty-third Street, New York City; Dr. Charles M. Cauldwell, physician-in-chief; 350 beds; semi-philanthropic.

The House of Rest for Consumptives, Bolton Road and Two Hundred and Ninth Street, New York City; George Sauer, superintendent; philanthropic; 39 beds.

St. Peter's Hospital, at Henry, Congress and Warren Streets, New York City; five wards reserved for consumptives; conducted by the Sisters of the Poor of St. Francis; Dr. T. P. Corbally, physician in charge; 75 beds; philanthropic.

Home for Incurables, Third Avenue and One Hundred and Eighty-first Street, New York City; Dr. Israel C. Jones, superintendent; 275 beds; tuberculosis wards.

New York Post-Graduate Hospital, annex for the treatment of tuberculosis (for poor patients only), at 322 E. Nineteenth Street, New York City; Dr. John F. Russell, physician in charge; 12 beds; philanthropic.

Kings County Hospital Infirmary, Clarkson Street, New York City; tuberculosis wards; Dr. F. W. Smith, resident physician; 65 beds.

Montefiore Home (ward for consumptives), Broadway and One Hundred and Thirty-eighth Street, New York City; Dr. S. Wachsmann, physician; A. Hausmann, superintendent; philanthropic; 40 beds.

The Riverside Sanatorium for Pulmonary Diseases; Health Department of the City of New York, at North Brother Island; Drs. S. A. Knopf, W. J. Pulley, and John H. Huddleston, visiting physicians; Dr. Samuel T. Watson, resident physician; 60 beds; public; free.

Lincoln Hospital and Home (tuberculosis ward) One Hundred and Forty-first Street and South Boulevard, New York City; Amzi Lake, superintendent; for colored; free; 40 beds.

Manhattan State Hospital East for the Insane, at Ward's Island, New York City; Dr. A. E. McDonald, superintendent; tuberculosis division.

Tent Colony for tuberculous men and women of the Willard State Hospital for the Insane, at Willard, Seneca County; Dr. Robert M. Elliott, superintendent.

County Hospital (tuberculosis ward), East View, Yonkers; public.

Phthisis Infirmary of the Metropolitan Hospital, at Blackwell's Island, New York City; under Homœopathic management; public; free; Dr. J. B. Mickle, chief of medical staff; 450 beds.

Seaside Tent Sanatorium for scrofulous and tuberculous children of the Society for Improving the Condition of the Poor, at Seabreeze, Coney Island; Dr. M. Burnham, resident physician; philanthropic; 54 beds.

Wards for tuberculous prisoners of Clinton Prison, at the Dannemora State Hospital; Dr. J. B. Ransom, medical officer.

NORTH CAROLINA.

The Winyah Sanatorium, at Asheville; Dr. Karl von Ruck, medical director; 70 beds; private.

Southern Pines Sanatorium, at Southern Pines; Dr. Edwin Gladmon, physician; 30 beds; private.

Pineshire Sanatorium, at Southern Pines; Dr. L. F. High, physician; 25 beds; private.

Franklin Humanitarian Home, at Black Mountain; philanthropic; 12 beds.

St. Joseph's Sanatorium, at Asheville; conducted by the Sisters of Mercy; 25 beds; private.

Dr. Martin L. Stevens's home for incipient tuberculous patients, at Asheville; 8 beds; private.

Dr. Dunn's Sanatorium for diseases of throat and lungs, Sunnyside, Sunset Mountain, Asheville; private.

NORTH DAKOTA.

Oak Park Sanatorium for consumptives, at Minot; Dr. V. Mohn, physician; 25 beds; private.

OHIO.

Cincinnati branch hospital for consumptives, Cincinnati, Ohio; public; Dr. B. F. Lyle, physician; 120 beds.

Municipal Tuberculosis Sanatorium, at Cleveland, Ohio; Dr. J. C. Placak, resident physician; F. C. Emde, superintendent; 75 beds; public.

Miami Valley Hospital, at Dayton; Ella P. Crandall, superintendent; tuberculosis division.

Western Hill Hospital and Sanatorium, at Price Hill, Cincinnati; Dr. Oswald Katz, resident physician; 30 beds; semi-philanthropic.

PENNSYLVANIA.

West Mountain Consumptive Hospital, at Scranton; philanthropic; Dr. J. M. Wainwright, physician; 26 beds.

South Mountain Camp Sanatorium, at Mont Alto, Franklin County; Major Oliver B. Simmons in charge.

Bide-Awhile Sanatorium, at Perkiomenville.

Tent camp for tuberculosis patients of the Columbus State Hospital for the Insane; 100 beds.

Mt. Jefferson Sanatorium, at Lansford (Summit Hill P. O.); Dr. W. H. Clewell, resident physician; 25 beds; private.

Private Sanatorium of Drs. J. T. and A. M. Rothrock, at Mont Alto, Franklin County; 10 beds.

The Darmady Sanatorium, at Mt. Airy, Philadelphia; Miss Margaret G. O'Hara, matron; 25 beds; private.

Sunny Rest Sanatorium, at White Haven; Elwell Stockdale, superintendent; Drs. L. F. Flick, Joseph Walsh, and William Stanton, visiting physicians; 50 beds; private.

White Haven Sanatorium of the Free Hospital for Poor Consumptives, at White Haven; Drs. Shoemaker and Heller, physicians; Dr. James H. Heller, superintendent; 126 beds; philanthropic.

Switchback Sanatorium, at Lansford.

Kane Summit Hospital, at Kane; Mary J. Hayes, superintendent; 50 beds.

Chestnut Hill Hospital for female consumptives, at Philadelphia; Dr. A. L. Bacon, resident physician; Rev. H. L. Duhring, superintendent; 65 beds; philanthropic.

House of Mercy for male consumptives, 411 Spruce Street, Philadelphia; Dr. W. M. Angney, house physician; Rev. H. L. Duhring, superintendent; 12 beds; philanthropic.

Philadelphia Hospital (wards for consumptives), Thirty-fourth and Pine Streets, Philadelphia; Dr. M. H. Briggs, chief resident physician; 174 beds; public.

Rush Hospital for Consumptives, 44 North Thirty-third Street, Philadelphia; Elizabeth M. Brophy, superintendent; 60 beds; philanthropic.

Henry Phipps Institute Hospital, 238 Pine Street, Philadelphia; Dr. Lawrence F. Flick, physician-in-chief; Mary Mahoney, superintendent; 52 beds; philanthropic.

Free hospital for consumptives of Pittsburg and Allegheny, 253 Shady Avenue, Pittsburg; Dr. Henry N. Hall, physician; 50 beds; philanthropic.

Tent camp in the Pocono Mountains for the treatment of consumption, at Greentown, Pike County; Dr. Albert S. Ashmead, physician; private.

Lucien Moss Home of Jewish Hospital, at Philadelphia; Dr. Edwin D. Jareckey, resident physician; 31 beds; philanthropic.

Reading Sanatorium for tuberculosis, at Reading.

RHODE ISLAND.

St. Joseph's Hospital, at Providence; wards for consumptives; Sister Superior, superintendent; Dr. William Hindle, resident physician; philanthropic; 24 beds.

Pine Ridge Camp for Consumptives, at Foster; Dr. W. H. Peters, physician; semi-philanthropic; 60 beds.

State Sanatorium, at Pascoag; 100 beds.

State Almshouse, tuberculosis division, at Howard; Dr. George F. Keene, physician in charge; 40 beds.

Tuberculosis Division of the State Hospital for the Insane, at Howard; Dr. George F. Keene, superintendent.

SOUTH CAROLINA.

Aiken Cottage Sanatorium, at Aiken; Dr. C. F. McGahan, physician; 15 beds; semi-philanthropic.

Separate building for tuberculous prisoners of State Penitentiary, at Columbia; Dr. D. J. Griffith, superintendent; 50 beds.

TEXAS.

Camp Reliance, at Comfort; Dr. C. H. Wilkinson; private.

Wynne Farm Agricultural Colony for tuberculous prisoners, at Huntsville; Dr. W. E. Fowler.

White Gables, S. W. Texas Sanatorium, at Boerne, Kendall County.

Sisters' Hospital, Hotel Dieu, at El Paso; tuberculosis wing, 50 beds; conducted by Sisters of Charity.

Dr. L. W. Cook's sanatorium, at Boerne; private.

Dr. Briggs's private sanatorium for diseases of throat and lungs, at Dallas; Dr. J. R. Briggs, physician; 60 beds; private.

VERMONT.

The Champlain Open-Air Sanatorium at South Hero; Dr. H. E. Lewis, medical director; 30 beds; private.

Ward for tuberculous patients of the Vermont State Hospital for the Insane, at Waterbury; Dr. M. Hutchinson, superintendent; 22 beds.

VIRGINIA.

Camp for tuberculous patients of the Central State Hospital for the Insane, at Petersburg; Dr. William T. Drewry, superintendent; 70 beds.

WASHINGTON.

King County Hospital, at Seattle; tuberculosis wards; 15 beds; Dr. William T. O'Rourke, superintendent; public.

WISCONSIN.

Evergreen Park Cottage Sanatorium, at Lake Nebagamon; Dr. W. B. Hopkins, medical director; private; 15 beds.

Wisconsin Dells Sanatorium, at Kilbourn.

Wisconsin Health Park Association, at Tomahawk, Lincoln County; Dr. W. T. Roberts, field secretary.

CANADA.

Free Home for Consumptives, at Gravenhurst; Dr. Charles D. Parfitt, physician in charge; 75 beds; philanthropic.

Muskoka Cottage Sanatorium, at Gravenhurst; Dr. J. H. Elliott, physician in charge; 75 beds; semi-philanthropic.

Toronto New Consumption Hospital of the National Sanatorium Association, near Toronto; Dr. Allan H. Adams, physician; philanthropic.

Lhal Ghur, private sanatorium, at Ste. Agathe des Monts, Quebec; Dr. Howard D. Kemp, physician in charge; 16 beds.

Montreal Sanatorium for consumptives, at Montreal.

Provincial Sanatorium for consumptives, at Montreal.

Wolfville Highlands Sanatorium, Nova Scotia; Dr. G. E. DeWitt, medical director; 8 beds; private.

(In no case are these institutions guaranteed; although I know absolutely no instance in which they should not be.—J. B. HUBER.)

List of dispensaries and clinics for pulmonary tuberculosis:

CONNECTICUT.

New Haven Dispensary tuberculosis clinic, Congress Avenue, New Haven; Dr. H. M. Steele, physician in charge.

ILLINOIS.

Dispensaries of the Committee on the Prevention of Tuberculosis of the Visiting Nurses' Association, 79 Dearborn Street, Chicago; Dr. Arnold C. Klebs, medical director.

MARYLAND.

Out-patient department, Johns Hopkins Hospital, Baltimore.

DISTRICT OF COLUMBIA.

Tuberculosis Dispensary, 605 Four and One-Half Street, S. W., Washington.

MASSACHUSETTS.

Boston Dispensary, at Bennet and Ash Streets, Boston; Dr. Edward O. Otis, superintendent.

Tuberculosis clinic, twice a week, at City Hospital, Worcester; Dr. Albert C. Gotshell, physician in charge.

MINNESOTA.

Hamlin University Free Dispensary, at Minneapolis; Dr. G. G. Poehler, physician in charge.

State University Free Tuberculosis Dispensary, South Washington Avenue, Minneapolis; Dr. Henry L. Ulrich, physician in charge.

NEW JERSEY.

Orange Memorial Hospital Dispensary, at Orange; Dr. Henry A. Tulsford, physician in charge.

NEW YORK.

Gouverneur Hospital Dispensary, Front Street, New York City; Drs. Gilbert and Bradford in charge.

Clinic for pulmonary diseases of the Health Department of New York City, at Sixth Avenue and Fifty-fifth Street; Dr. H. M. Biggs, director; Drs. J. S. Billings, Jr., and S. A. Knopf, associate directors.

Special classes at the Vanderbilt Clinic for the treatment of Tuberculosis; Dr. Linsey R. Williams, physician.

Special classes at Bellevue Hospital Dispensary; Dr. James Alexander Miller, physician.

New York Postgraduate Hospital Dispensary (Dr. Russell's classes).

Dispensary for consumptive poor of the New York Throat, Nose, and Lung Hospital, Fifty-ninth Street, near Second Avenue; Drs. Birmingham, Barton, Goldstein, and Wheeler, physicians.

Presbyterian Hospital Dispensary, New York City.

Harlem Hospital Dispensary, foot of East One Hundred and Twentieth Street, New York City; Dr. Charles H. Moak, physician in charge.

OHIO.

Tuberculosis dispensary of the Western Reserve University, at Cleveland; Dr. T. H. Lowman, physician in charge.

PENNSYLVANIA.

Tuberculosis dispensary of the Scranton Society for the Prevention and Cure of Consumption, 203 Linden Street, Scranton, Pa.

Henry Phipps Institute Dispensary, 238 Pine Street, Philadelphia.

Rush Hospital Dispensary, Lancaster Avenue and Thirty-third Street, Philadelphia; Dr. John D. McLean.

Dispensary of the White League, 1515 Arch Street, Philadelphia; Dr. Joseph P. Craney, physician.

RHODE ISLAND.

Out-patient department of the Rhode Island Hospital, at Providence; Dr. Jay Perkins, superintendent.

Index

A

Abyssinians, 101
Acquired immunity, 189
Active immunization, 190
Acute miliary tuberculosis, 58, 404
Adams, 450
Adenitis, 74
Adenoids, 74, 154, 174
Adirondack Cottage Sanitarium, 247
Administrative measures, 94, 357
Adolescence, 66, 183
Adrenals, 81
Adult, 183
Adulteration of food, 370
Advanced tuberculosis, 404
Agglutination, 190, 191
Agricultural insurance, 290
Air, 200
Alcohol, 26, 75, 85, 107, 143, 205, 466
Alimentary tract, 79
Alland, 287
Altitude, 82
American Federation of Labor, 368
Amusements, 269
Anæmia, 74
Anatomical modifications, 75, 113
Ancestry, 23
Antistreptococcus sera, 193
Antitoxin, 69, 191
Apartments, 136, 355
Apex of lung, 79
Aphrodisiæ, 42
Aristotle, 41
Aritæus, 42
Arosa, 289
Arrest of spitters, 167
Art, 17, 32
Associational enterprises, 382, 514
Asthma, 26
Atmosphere, 60, 82
Atwater, 143
Austrian sanatoria, 287
Avenues of infection, 61, 78
Avicenna, 43

B

Bacilli, 51
 of Koch, 54, 411
Bacon, 373
Bacteria, 51
 in milk, 420
Bacterial immunity, 192
Bactericidal sera, 191, 192
Bacteriological examination, 228, 340
Bahamas, 101
Ball, 348

Baltimore Exposition, 390
Barker, 68
Barnyard, 417
Barton, 228
Baruch, 467
Basel, 289
Bashkirtseff, 34
Bathing, 186, 207
Beata Beatrice, 39
Beaumont, Madame de, 46
Bedford, 240, 257, 304
Bedroom, 199
 disease, tuberculosis a, 131
Bennet, 202
Bennett, 281
Berck-sur-Mer, 236
Berlin Brandenburg Union, 334
Bermuda, 101
Bielefeldt, 98
Briggs, 91, 135, 340, 488
Bigotry, 43
Birth, 23, 73
Bitters, 85
Black death, the, 40
Blackwell's Island, 255
Blackie, 185
Blepharitis, 74
Bligny, 286
Board of Health, Imperial German, 61,
 98, 207
Bodington, 281
Bolingbroke, 247
Boston, 110
 tenements, 451
Botticelli, 38
Boucicault, 286, 383
Bovine tuberculosis, 63, 65
Bowditch, 263
Brandt, 89, 95, 104, 135
Bracken, 178, 316
Brannan, 239
Brehmër, 294
Broadbent, 330
Brompton Hospital, 281
Bronchitis, 74
Browne, Sir Thomas, 73
Bubonic plague, 41
Buckley, 103
Bullock, 24
Bulstrode, 135, 157, 441
Bureau, U. S., of Animal Industry, 421
Bush, 348

C

Caillé, 178
Calmette, 228

- Camp at Lake Placid, 222, 479
 in winter, 216, 268, 319
 Canadian financing, 330
 sanatoria, 275
 Cancer, 26
 Canigou, 286
 Carlyle, 431
 Carrington, 226
 Caseation, 71
 Casimir-Perier, 326
 Cassell, 284
 Catanea, Simonetta, 38
 Cattle, tuberculosis in, 63, 65, 421
 Cavity in lung, 57
 Cell, 75
 Celsus, 40
 Central Federated Union, 385
 Certified milk, 419
 Chandler, 166
 Channels of infection, 78, 134, 395
 Charity, 434
 Organization Society, 387, 502, 503,
 505
 Chateaubriand, 46
 Cheesy degeneration, 57
 Chicago University, 451
 Child labor, 95, 364, 382
 Children, 131, 171
 hospital for tuberculous, 236
 tuberculosis in, 65, 80
 Children's Aid Society, 137
 Chinese, 104, 109
 Chlorosis, 74, 81
 Cholera, 40, 76
 Chopin, 33, 46
 Christianity, 448
 Churches, 133, 166
 Ciliæ, 59
 Circulation, 74, 81
 Cities, American, 136
 prominent, of the world, 111
 City and suburban homes, 378
 City life, allurements of, 258
 Claghorn, 348
 Clapp, 263
 Classification of cases, 404
 Cleanliness, 163
 Clement, 86
 Clergyman, letter of a, 170
 Climate, 204, 271, 303
 Closed stage, 400
 Clothing, 188
 Cocchi, Antonio, 44
 Cocci, 51, 60, 193
 Cold, taking, 79
 Coleman, 101
 College settlement, 230
 Colonie agricole, 314
 Comfort stations, public, 134
 Commissions, 377, 514
 Complementary air, 188
 Conception, 23, 73
 Condensed milk, 414
 Congresses, 368
 Consanguinity, 76, 85
 Construction and cost of sanatoria, 490
 Consumption, 60
 Contagion, 53
 Convalescence, 188
 Cordial relations of sanatoria with
 neighborhoods, 257
 Cornet, 98, 112, 129, 133, 172, 360, 425
 Corporations and spitting, 366
 Coryza, 74
 Cough, 209
 Course of infection, 134
 Court-rooms, 166
 Cows, 418, 425, 426
 Cream, 415
 Crippled and Deformed Children, New
 York State Hospital for, 241
 Ohio State commission, 242
 Curative stage, 359
 Cure, 195
 the means of, 211
- D**
- Dangerous trades, 117, 133
 Daniels, 137
 Daremberg, 202
 Davos, 288
 Day nurseries, 384
 Death, 23
 de Forest, 347
 Degeneracy, 171
 Dementia, 317
 Denominational sanatoria, 272
 Denver Y. M. C. A., 313
 Descartes, 430
 Dettweiler, 291
 Devine, 230, 385
 Diabetes, 81
 Diagnosis, 373, 399
 Diet kitchen associations, 384
 Discipline in sanatoria, 292
 Disinfection, 341, 461
 Dispensaries, 224, 343, 359, 362
 District nursing, 174, 230, 252, 341
 Döckersche barracken, 290
 Droplets of sputum, 61
 Drugs, 206
 Ducker tent, 219
 Duckworth, 74
 Dumb-bell tenements, 353
 Dundee, 135
 Dust, 134, 167
- E**
- Early diagnosis, 399
 Easton, 120
 Ecclesiastes, 168
 Economics, 89
 Education, 341, 376
 Edwards, 124
 Effertz, 160
 Elliott, 276, 512
 Embryo, 77, 173
 Emerson, 66, 431
 Emphysema, 74

Employees, infection by, 131, 137
 Enclosure, 131
 England, insurance in, 329
 English National Association, 97
 sanatoria, 281
 Environment, 82, 173
 Esser, 79
 European states, tuberculosis in, 110
 Evolution, 21
 Ewing, 84
 Examination, technique of, 404
 Exanthemata, 81
 Exercise, 185, 208, 262, 268
 Exposition, 390
 Extrinsic predisposing factors, 82

F

Factories, 95, 164
 Factory inspection, 366
 Faith cures, 206
 Falkenstein, 291
 Family disease, tuberculosis a, 73, 133
 physician, 276, 373
 Forms, 312, 423
 Febrine, 66
 Federal jurisdiction, 111, 367
 Feustman, 223, 491
 Fibrosis, 58
 Fijis, 101
 Finance, 326
 Fire-escapes, 200
 Fisher, 214, 472
 Flats, 354
 Flick, 54, 101, 131, 229, 356
 Flies, 62, 168
 Florentine Medical College, 44
 Fœtus, 77
 Folks, H., 120, 255
 Folks sanatoria, 290
 Food, 205
 badly cooked, 113
 gratuitous distribution of, 342
 impure, 370
 infection through, 62
 Forcible removal to institutions, 341
 Forestry, 314
 Fort Bayard, 269
 Stanton, 265, 513
 Fraenkel, 161
 France, 135
 Franklin, 379
 Freeman, 413, 420
 French hospitals for tuberculous chil-
 dren, 236
 sanatoria, 286
 windows, 179
 Fresh air, 200
 Fulton, 393
 Functional modifications, 75, 173

G

Galen, 40, 42
 Gardiner tent, 215, 474
 Garth, 17

General practitioner, 373
 German Central Committee, 334
 Imperial Board of Health, 61, 207
 insurance, 97, 292, 329, 331
 sanatoria, 290
 Germs, 51
 Ghosts, 66
 Gibraltar, 101
 Glanders, 76
 Goerbersdorf, 292, 295
 Goodsell-Bedell bill, 449
 Gould, E. R. L., 378
 Grabfelder, 273
 Grashy, 316
 Grabowsee, 290
 Green sickness, 81
 Greenwood, 317
 Guaranteed milk, 422
 Gymnasium, 176, 180, 187

H

Habits, 118
 Hamburg, 135
 Hanseatische Versicherungsanstalt, 292
 Hardening, 467
 Harris, 100, 103
 Harney, G., 32
 Hassall, 283
 Hawthorne, 73
 Health Board, Imperial German, 61, 98
 Department of New York City, 340,
 414
 Heart, 74
 Hebrew Aid Society, 137
 Heine, 448
 Help that harms, 439
 Hemorrhage, 208, 268
 Heredity, 26, 73, 428, 431
 Hillier, 111, 329
 Hip disease, 80
 Hippocrates, 40
 History of consumption, 41
 taking, 408
 Hoffman, 89, 95, 328
 Hohenhonnef, 292
 Holmbae, 361
 Holmes, O. W., 85, 171, 327
 Holmes pavilion tent, 216
 Homes, 129, 308, 358, 363
 "Home, The," 272
 Hospitals, 45, 308, 343, 358, 363, 517
 for tuberculous children, 237, 314,
 364
 Hotels, 133, 165
 House, the, 131,
 Huddleston, 228
 Humidity, 83
 Hunter, 103
 Hydrotherapy, 467

I

Ibsen, 66
 Illinois, 90
 State Board, 462
 Immigrants, 369

- Immunity, 68, 107, 189
 Imperial Board of Health of Germany,
 61, 207
 Workman's Insurance Office, Ger-
 many, 517
 Incidental nurse, 233
 Incipient tuberculosis, 404
 Indian, 103
 Indiana State Board, 91
 Medical Association, 245
 Individual enterprises, 383
 Infantilism, 74
 Infants, infection of, 61
 Infection, 42, 53, 61, 131, 199, 307
 Ingestion infection, 62, 64, 168
 Inhalation infection, 160
 Inherited immunity, 68
 Injudicious charity, 437
 "Ink Pot, The," 148
 Inoculation infection, 62, 165
 Insane asylums, 316
 Insanity, 26, 75
 "Inspected" milk, 419
 Inspection of meats, 370
 of milk, 414
 Inspector, Medical School, 179
 tenement house, 139
 Instructive nurse, 232, 233
 Insurance, 93, 292, 327, 331
 International congresses, 368
 Intestinal tuberculosis, 65
 Intrinsic factors, 78
 Invalidenheime, 310
 Irish, 104
 Irving, Henry, 30
 Isolation Hospital, 310
 Italian, 104
- J**
- Jacobi, 131, 468
 Jacobs, 395
 Jefferson, 444
 Jenner, 40, 189
 Jewish Sanatorium at Denver, 313
 Jews, 101, 134
- K**
- Kant, 25
 Keats, John, 36
 Kellynack, 143
 Kennedy, 385
 Kentucky State Board, 465
 King, 259
 Klenke, 47
 Knopf, 224, 360, 382
 Koch, 51, 193
 "Kochine," 376
 Koch's requirements, 54
 Kosher meat, 106
- L**
- Labor organizations, 314, 368, 385
 Lacteals, 64
 Lactometer, 417
- Laennec, 47
 La Fetra, 176
 Laissez-faire, 339
 Lancereaux, 143
 Landouzy, 143
 Lankester, 21
 Lapham, 465
 Latency, 66
 Latham, 284, 464, 485
 Law, 358
 Lay press, 376
 Lean-to, 221, 260, 481
 Lecky, 336, 437
 Lectures, 377
 Legislation concerning bovine tuber-
 culosis, 65
 Le Page, 35
 Leprosy, 69
 Leucocytes, 53
 Liberty, 259
 Liegehalle, 285, 295
 Life, 24, 73
 insurance, 290, 328
 Limit of sanatorium treatment, 302
 Literature, 17, 32
 Locke, John, 160
 London, 135
 Open-air Sanatorium, 283
 Loomis, 249, 299
 Sanatorium, 259
 "Lung block," the, 111, 147
 normal, 56
 "Lunger," 124
 Lymph-glands, 59, 74
- M**
- MacCormac, 281
 McDonald, 318
 Madeira, 101
 Mahommedanism, 43
 Maine Sanatorium, 493
 Malaria, 69
 Malformations, 74
 Malnutrition, 225
 Malthus, 226
 Manhattan, 108
 State Hospital for Insane, 318
 Maragliano, 189, 377
 Marclay, 265
 Marine Hospital Service, 265, 368
 Marriage, 19, 96, 171
 Marshall, 421
 Martin, 64
 Maryland Tuberculosis Commission, 56,
 91, 255
 Massachusetts State Health Board, 466
 State Sanatorium, 262, 494, 498
 Masten tent, 217
 Maternity, 173
 Matter, 29
 Meat, inspection of, 370, 420, 426
 unclean, 443
 Medicines, 205
 Meissen, 293

- Menard, 286
 Meninges, 80
 Mesentery, 78
 Metabolism, 74, 80, 205
 Metchnikoff, 53
 Metropolitan Hospital Infirmary, 477, 500
 Meyer, 312
 Microbes, 51
 Micro-organisms, 51
 Middle Ages, 43
 Miguel, 84
 Milch cattle, 420
 Miliary tuberculosis, 58, 404
 Milk commission, 417
 modified, 240, 413
 Milkmen, 418
 Millard, 101
 Millet, 216
 Milton, 453
 Mind, 24, 29
 Miners, 116,
 Model tenements, 373
 Moderately advanced tuberculosis, 404
 Montefiore Home Country Sanatorium,
 240, 258
 Moore, 361
 Morgagni, 44
 Mortality, 18, 40, 93, 113
 Morton, 44
 Mother, consumptive, 62
 Mouth-breathers, 59
 Munich, 113
 Muskoka, 275
 shacks, 216, 275
- N**
- Naegali, 20
 Naples, 45
 Nasal passages, 59
 Nassau, 101
 Nathan cottage, 223, 489
 National Association for the Prevention
 of Consumption (England),
 310
 for the Study and Prevention of
 Tuberculosis, 394
 Child Labor Committee, 382
 Consumer's League, 364, 382
 Jewish Hospital, 272
 Sanatorium Association (Canada),
 385
 Natural immunity, 68, 189
 Negro, 69, 100, 134
 tenements for the, 379
 Newcomb, 258
 New Hampshire Commission, 91
 New York City's Health Department,
 340, 414
 loss through tuberculosis,
 42
 County Medical Society's milk
 inspections, 417
 State Hospital for the Treat-
 ment of Incipient Tubercu-
 losis, 259
- Nocard, 45
 Noisy, 237, 314
 Nordrach ranch, 315
 tent, 475
 Norway, administrative work in, 361
 Notification, 137, 340
 Nuns, 316
 Nurse's kit, 234
 Settlement, 230
 Nursing, 174, 230
 Nutting, 232
- O**
- Obligate parasite, 54
 Occupations, 112, 131
 Octavia Hill, 452
 Oderberg, 292
 Offspring, 171
 Ohio State Commission, 90, 327
 Olivuzza, 45
 Ontario, 386
 Open-air colonies, 312
 stage, 400
 Osler, 71, 134, 193, 357
 Otis, 224
 Overcrowding, 108, 135
 Oxygen, 75, 153, 200
- P**
- Parasites, 54
 Paratriptics, 144
 Parfitt, 276, 512
 Parliamentary Commission concerning
 causes of deterioration, 146
 Passive immunization, 190
 Pasteur, 51
 Patent medicines, 370
 Paternalism, 339
 Pathology, 42
 Patient, the, 197
 Patterson, 348
 Pavilion tent, 216
 Pellegrin, 219
 Penn, 110
 Peoples, 100
 People's Cure Dwelling-Home Union, 334
 Periadenitis, 74
 Peritoneum, 80
 Peters, Michael, 132
 W. H., 219
 Petit, 219
 Philanthropy, School of, 385
 Phipps, Henry, Institute, 229, 501
 Phthisiophobia, 227, 445
 Phthisis, 2, 60
 Physical culture, 180
 diagnosis, 402, 410
 Physician, 197
 Physiological life, the, 185
 Plant, Fruit, and Flower Guild, 384
 Pneumonia, 76
 Politics, 368
 Polyklinik für Lungenkranke, 228
 Poole, 86, 137, 148
 Poor Richard, 89

- Portugal, 46
 Posterity, 23
 Post-Graduate Hospital Dispensary, 228
 Post-natal, 73, 78
 Pottenger, 90, 157, 307
 Potter, Bishop, 270, 439
 Pott's disease, 80
 Poverty, 47, 135
 Powell, 441
 Predispositions, 73, 153
 Pre-natal, 73, 76
 Presbyterian Hospital Dispensary, 228
 Prescott Reception Cottage, 252, 490
 Preventable conditions, 152
 Prevention, 157
 Price, 393
 Principles of cure, 199, 206
 Prison, 321
 Prisoners, habits of, 322
 Probst, 178
 Prophylaxis, 44, 45
 Proportion, a sense of, in measures
 against infection, 170
 Prostitution, 348
 Proverb, German, 32
 Prudden, 51
 Prudential Life Insurance Company, 328
 Prussia, 98
 Pryor, 387, 512
 Pseudo-nurse, 233
 Psychism, 29, 76
 Public buildings, 133
 comfort stations, 134
 house, 145
 institutions, 344
- Q**
- Quack advertisements, 376
- R**
- Races, 100
 Railway cars, 166
 disinfection, 465
 Ransom, 282, 321
 Ravenal, 63
 Raybrook, 510
 Reception hospital at Saranac Lake, 490
 Recreation, 268, 305
 Red Cross, 290
 Registration, 94, 137, 340, 358
 Reiboldsgrün, 293
 Re-infection, 62
 Religion, 368, 437
 Renaissance, 44
 Requirements in a sanatorium, 284
 in a tent, 214
 Residual air, 188
 Respiration, 75, 188
 Respirator, Fraenkel's, 161
 Rest, 199
 Results of administrative measures in
 New York City, 345
 sanatorium treatment, 302, 507
 Retrospect, scientific, 428
- Revolving shelter, 219
 Rhode Island, 101
 Richardson, 281
 Riverius, Lazarus, 44
 Riverside Hospital, 256
 Rockefeller Institute, 419
 Roger, 76
 Römpler, 296
 Roof pavilions, 383
 Rosenberg, 240
 Rosetti, 38
 Roux, Emile, dispensary, 228
 Royal Hospital for Diseases of the Chest,
 281
 Sea-bathing Infirmary for Scrofula,
 281
 Ruppertshain, 291
 Rural districts, 85
 Rush, 101, 103
 Hospital, 484
 Rutland, 262
- S**
- St. Joseph's Hospital for Consumptives,
 256, 308
 St. Louis Exposition, 180
 Sajous, 81
 Saloons, 165, 360, 384
 Salvation Army, 234
 Sanatoria, 284, 344, 359, 517
 American, 243
 beneficial to their neighborhood,
 296, 300
 European, 281
 Sanatorium construction and cost, 490
 Sand, George, 46
 Saprophyte, 54
 Saracenic medicine, 43
 Saranac Lake, 247
 Savage, 187
 Saxony, municipal control in, 361
 Scandinavia, 104
 Schiller, 445
 Schmidt, 118
 Schmorl, 79
 Schools, 95, 166, 176, 383
 Schopenhauer, 29
 Scientific retrospect, 428
 Sclerosis, 71
 Scopes, 223, 491
 Scrofula, 26, 67, 74, 173, 428
 Seamen, 265
 Sectional maps, 345
 Sending patients from home, 374
 Separation of consumptive mother from
 infant, 174
 Servants, inspection by, 131, 137
 Sexual tendency, 207
 Shakespeare, 78, 189, 206
 Sharon Sanatorium, 303
 Shaw, Bernard, 87
 Sherwood Forest Sanatorium, 282, 494
 Shively, 228
 Shower-bath, 176

Silenius, 44
 Silver City Sanatorium, 270, 513
 Simian tuberculosis, 40
 Singing, 187
 Single life, 96
 Sing-Sing Prison, 321
 Sleep, 209
 Smallpox, 40, 76, 189
 Smith, Goldwin, 378, 380
 Social customs, 120
 Société des Hôpitaux, 310
 Sociological résumé, 433
 Soil inviting tubercular infection, 74
 Soldier, 118
 Sophocles, 76
 South Australia, administrative work in, 361
 Sower, parable of the, 71
 Space, 25
 Spain, 46
 Special hospitals, 517
 Spencer, E., 23
 H., 82
 Spirilli, 52
 Spirit, 29
 Spit-cups, 162
 Spitters, arrest of, 167
 Spitting, 344
 Sputistics, 390
 Spray of sputum, 61
 Sputum, 61
 free examination, 340
 Stables, 418
 Stafford, 441
 Staining for tubercle bacilli, 411
 Staphylococci, 51
 Starvation, 225
 State Invalidity Insurance, German, 293
 jurisdiction, 364
 tuberculosis camp, 222
 Statistics of insane asylums, 317
 Sternberg, 111, 395
 Stevens, 305
 Stevenson, R. L., 32, 236, 252
 Stigma, 26, 171, 173
 Stimulants, 144
 Stone, 110
 Stony Wold, 240, 258
 Strathcona and Mount Royal, 385
 Strauss, 384, 414
 Streets, 167
 Street-sweepers, 117
 Streptococci, 51
 Subway, 166
 Sun-baths, 204
 Sunshine, 201
 Surgical tuberculosis, 82, 240
 Survival of the fittest, 21
 Susceptibility, 52, 76
 Sweat-shops, 137
 Switzerland, 288
 Sympathetic nerve, 29
 Symptomatology, 373
 in children, 179
 Syphilis, 26, 66, 75
 Syrian, 109

T

Tarbell, 433
 Tariff, 369, 441, 442
 Tea, 187
 Technique of examinations, 404
 "Temperament, scrofulous," 67, 74
 Temperature, 401
 Tendency, 52, 74
 Tenement-house Commission of New York City, 347
 Department of New York City, 347
 Tennyson, 371
 Tents, 213, 472
 Thomas, 90, 268
 Thorax, 74
 Thoroughfares, 167
 Throats, unhealthy, 74
 Tidal air, 188
 Time, 25
 Timrod, H., 36
 Tobacco, 209
 Tonsils, 74, 153, 174
 Toronto Hospital, 276
 tenements, 380
 Toxic immunity, 192
 Toxins, 52
 Trades, dangerous, 133
 Trinity Church Corporation, 450
 Trolley-cars for consumptives, 219
 Trudeau, 49, 192, 249
 Tubby, 243
 Tubercle, 19, 56
 bacillus, 18, 54, 411
 Tuberculin, 193, 403, 411
 for cattle, 422
 Tuberkulose Merkblatt, 334
 Tuberculosis, 60
 miliary, 58, 404
 Tucker tent, 215, 313, 476
 Turban, 288, 405

U

Ullesperger, 46
 Ulrich tent, 215, 472
 Uncleanliness, 135
 Underfeeding, 135
 Underwear, 209
 United Garment Workers of America, 385, 502
 Hebrew Charities, 382
 United States Bureau of Animal Research, 421
 Government sanatoria, 265
 University of Chicago, 451
 Untoward sociological factors, 433

V

Vaccination, 189
 Valsalva, 44
 Veiller, 108, 348
 Ventilation, 163, 176
 Ventnor, 283
 Vermont, 377
 Vesicles in lungs, 57

Villepinte, 238
 Villiers, 238, 314
 Virulence of infection, 132
 Visiting nurse, 230, 232
 Volksheilstätte, 290
 Von Behring, 80, 191
 Vulnerability, 52, 74

W

Wainright, 189
 Wald, 230
 Wales, 97
 Walker, J. B., 180
 Walking, 185
 Ward, 35, 236
 Washington, 111, 394
 Sanitary Housing Company, 379
 Weicker, 292
 Welch, 395
 Wellesley Hills, 241
 West, 124

White swellings, 80, 174
 Widowed, the, 96
 William I., Emperor, 331
 Wilson, 110
 Winter quarters, 216, 267, 319
 Withered, 152
 Wokingham, 283
 Wolff, 294
 Woodbury, 84
 Workmen's insurance, 290
 Workshops, 133, 164, 366
 Wykoff, 138, 437
 Wynne Farm, Texas, 325

Y

Yellow fever, 41, 69

Z

Zoebisch, 294
 Zuydcoote, 238

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